THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—23RD YEAR. SYDNEY, SATURDAY, FEBRUARY 15, 1936. No. 7.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— PAGE.

Traumatic Lesions of the Knee Joint, by JOHN S. MACMAHON, M.B., Ch.M., F.R.C.S., F.R.A.C.S. 221

Internal Derangements of the Knee Joint, by MCCLEMENTS CALLOW 228

The Neural Components of Teratomata, by R. A. WILLIS, M.D., D.Sc., M.R.C.P. 231

A Papuan Field Experiment of Malaria Treatment, by F. W. CLEMENTS, M.B., B.S., D.P.H., D.T.M. 235

REPORTS OF CASES—

A Case of Agranulocytosis, with Recovery, by ALLAN S. WALKER, M.D., Ch.M., and R. A. GREEN, M.B., B.S. 238

REVIEWS—

Psychoanalytical Letters 239

The Single Woman 239

Epidemiology 240

NOTES ON BOOKS, CURRENT JOURNALS AND NEW APPLIANCES—

Letters from Italy 240

LEADING ARTICLES—

The Rights of the Patient 241

CURRENT COMMENT—

Chrysotherapy and Punctate Basophilia 242

Epidemic Dropsy 243

ABSTRACTS FROM CURRENT MEDICAL LITERATURE— PAGE.

Pædiatrics 244

Orthopædic Surgery 244

BRITISH MEDICAL ASSOCIATION NEWS—

Scientific 246

Nominations and Elections 249

MEDICAL SOCIETIES—

Public Medical Officers' Association of New South Wales 249

MEDICAL PRACTICE—

The Adelaide Radiotherapy Clinic 250

POST-GRADUATE WORK—

The School of Public Health and Tropical Medicine, University of Sydney 251

CORRESPONDENCE—

Mangoes and Boils 251

OBITUARY—

William Henry Crago 252

AUSTRALIAN ARMY MEDICAL CORPS 252

DIARY FOR THE MONTH 252

MEDICAL APPOINTMENTS VACANT, ETC. 252

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 252

EDITORIAL NOTICES 252

TRAUMATIC LESIONS OF THE KNEE JOINT.[1]

By JOHN S. MACMAHON, M.B., Ch.M. (Sydney), F.R.C.S. (England), F.R.A.C.S.,

Sydney.

TRAUMATIC affections of the knee joint are becoming more frequent owing to the increase in motor traffic, the hazards of our growing industries, and the popularity of field sports. Although there is an extensive literature dealing with the subject, it is always of interest to discuss new phases and different aspects, and to review older ideas and methods. If honestly carried out, this study must lead to an increase of our knowledge, and to more perfect diagnosis and treatment.

Upon the accurate knowledge of structure, of function, and of pathology depends the rapid recognition of the lesion, which, in turn, promotes the early adoption of suitable therapy.

The knee joint is the largest joint in the body, and, from a mechanical point of view, appears to be weak and unstable. The apparent weakness lies in the fact that the bony parts show little adaptation to one another. The actual strength lies in the breadth, and in the practically horizontal level of the opposed femoral and tibial surfaces, and in the short, strong ligaments augmented by the insertion of muscles which keep the bones in proper apposition during movement; these tend to limit movement, and to prevent abnormal movement, thus stabilizing the joint. In the upright attitude, the femur rests directly upon the tibia, not directly supported by any ligament, but maintained by postural muscle tone.

The human knee joint is the only knee joint that admits of complete extension. It is a specialized hinge joint, in which some rotation is normally present at the beginning of flexion and at the completion of extension.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on November 28, 1935.

The body is not solely provided with uniaxial hinge joints which allow of progression and movement in one direction only. Torsion of the body is effected by the summation of rotatory movements occurring in the mid-tarsal, sub-taloid, knee, hip and spinal joints, whilst the foot is firmly implanted on the ground; thus, one is able to develop a "swing" or "follow-through" in playing such games as golf and cricket. In primates rotation at the knee joint is present to an even greater degree than in man, and this is the case both during flexion and extension. Smooth cartilage-covered facets are found between the lateral ligaments and both condyles of the tibia. The internal lateral ligament is not attached to the internal condyle of the tibia and then prolonged down the shaft, as in man, but passes straight from the internal condyle of the femur downwards and forwards to the inner surface of the shaft of the tibia. The lateral ligaments in primates thus function in the mechanism of rotation. In man, where stability is essential, the power of rotation is diminished, and, accordingly, the function of the internal lateral ligament is modified.

Owing to the obliquity of the femur in man, the lateral condyle is more in the line of transference of body weight, and so is thicker and stronger than the medial. For this reason a greater strain is thrown on the medial than on the lateral aspect of the joint; hence the need for a strong internal lateral ligament—a broad, strap-like structure, extending from the medial condyle to the tibia and consisting of superficial and deep fibres.

Unlike the internal, the external lateral ligament is distinct and separated from the capsule. The external cartilage has not, therefore, the same intimate connexion with the ligament that its companion has on the inner side.

The cruciate ligaments are situated in the centre of the articulation and have a very important function. The anterior cruciate ligament is tense when the knee is fully extended and prevents the tibia from being displaced forwards on the femur. The posterior cruciate ligament is tense in complete flexion and prevents the tibia from being displaced backwards on the femur. It also holds the bones in contact on the more curved posterior aspect of the femoral condyles at the completion of flexion, when the internal lateral ligament is relaxed.

Both ligaments are said to check internal rotation. The patellar ligament extends from the tibial tubercle to the patella, which is merely a sesamoid bone in the tendon of the quadriceps.

Menisci are found in vertebrates as low down in the animal scale as amphibians. In mammals the bat is unique in that it has no trace of them. In this animal the joint is a pure ginglymus, rotation being prevented by a bony spur. In one species of bat (*Plecotus*) the knee joint does allow a certain amount of rotation, and in it menisci are found as very delicate rings.

Parsons has put forward the idea that menisci are intended to provide separate joints, one above for hinge movements and another below for rotatory or gliding movements.

More recently, MacConnail, of Sheffield, has compared the intraarticular fibro-cartilages in function with the Michell Thrust pad, used in lubrication in engineering problems. He has shown by reference to the theory of lubrication that intraarticular fibro-cartilages are related primarily to the synovial fluid, rather than to the articular surfaces of the bones. They act by bringing about the formation of wedge-shaped films of synovial fluid in relation to the weight transmitting parts of joints in movement. These wedges are narrow in the direction of motion and are necessary for weight transmission.

A complete understanding of the structure and function of the knee joint, therefore, is of fundamental importance in considering the effects of trauma on this important joint. The effects of injury will depend on its nature, intensity, the position of the joint and state of contraction of the muscles of the limb at the time of injury; and, in order of frequency, the ligaments, the cartilages or the bones will be involved.

It is clearly impossible in this communication to deal with all aspects of knee joint injury, and I intend to confine my attention to those affecting the ligaments particularly and to fractures involving the joint.

Sprain of the Knee Joint ("Acute Traumatic Synovitis").

The term acute traumatic synovitis is often loosely applied to many injuries of the knee joint in which the outstanding feature is an effusion into the joint. It has, indeed, become the dead letter office of casual and misdirected diagnosis. It is merely a sign of an injury, the specific nature of which must be carefully sought by a detailed physical examination, supplemented by radiography, in order that adequate treatment may be instituted. Particular care must be paid to the history of the injury and the mechanism of its production. It is important to know whether there was any locking of the joint, the point of maximum tenderness should be carefully sought for, the stability of important ligaments examined, and pain on movement in various directions determined.

Sprain of the knee joint results from stretching or twisting forms of violence, which cause the knee to move beyond its physiological limits, or in some direction for which it is not structurally adapted. The ligaments bear most of the strain and are stretched or torn. The synovial membrane is also torn and the joint fills with an effusion which is more or less blood-stained.

Minor sprains constitute the commonest injuries to this joint, but the diagnosis should be made only after exclusion of more serious forms of injury. Treatment by some form of elastic pressure or compression bandage to prevent effusion, combined with rest, is usually sufficient to permit return of normal function. One very often, however, sees patients attend hospital some weeks or months after an injury to the knee joint, which has been diagnosed and treated as synovitis, but in which more serious injury is present. The latter has often been aggravated by inadequate treatment, and pain and disability have persisted. The following cases are illustrative of this.

CASE I. *Fracture of the Medial Spine of the Tibia.*—In 1924 a male patient, aged twenty-four years, a footballer, was running with the ball and, in endeavouring to evade an opponent, "propped". He was then tackled by another player from the front, and his knee came in contact with his opponent's shoulder. His opponent grasped him around the calf of the leg, hyperextending his knee joint and throwing him to the ground. A diagnosis of traumatic synovitis was made, no X ray examination being carried out. A compression bandage was applied to limit the effusion, and he was told to walk about and to keep the knee joint movable. His disability increased, and he could move about only with difficulty. Later he went through the usual routine of physio-therapeutics, massage, diathermy, hot air, and various forms of ionization. During this time active movements were persisted in—rest was not permitted. For the next twelve months, following any active exercise, he suffered recurrent attacks of synovitis. He was then seen in consultation by another surgeon. Radiography revealed an ununited fracture of the spine of the tibia (see Figure I), with early osteoarthritis of the knee joint. Rest to the knee joint was then prescribed, and the condition gradually improved. During the last ten years he has been able to carry out active exercises and, although the arthritis has increased somewhat, he has no great disability.

The nature of this accident, forcible hyperextension, should have suggested a rupture of the anterior cruciate ligament or fracture of the medial spine of the tibia. Neglect of X ray examination led to ineffectual treatment. If the patient's knee joint had been immobilized and put at complete rest, his convalescence would undoubtedly have been shortened, and he would not have had the degree of disability which persisted during the ensuing years.

Another interesting feature of this case is that, when twelve months after the original injury the X ray examination revealed an ununited fracture of the medial spine of the tibia, operation for its removal was advised by two different surgeons. The fear of operation on the knee joint, so deeply rooted in the lay mind, led to caution and operation was refused. This year (1935) a further X ray examination was made and showed the fragment to be firmly united (see Figure II). "The forgotten specialist", in the course of time, had produced union of the fragment which competent surgeons sought to remove.

CASE II. *Ruptured Internal Lateral Ligament with Bone Avulsion.*—A male patient, aged thirty-six years, in February, 1933, slipped on a piece of grease-paper with his leg hyperextended and abducted. He was unable to get up on account of severe pain in the knee joint. A diagnosis of traumatic synovitis was made and Scott's dressing was applied. For six weeks he was able to get about only on crutches. No X ray examination was carried out. The knee joint remained painful for six months, when a slight accident aggravated the disability. He then attended at the Royal Prince Alfred Hospital, where examination revealed marked tenderness over the femoral attachment of the internal lateral ligament, but no effusion into the joint. Abduction at the knee joint caused severe pain. X ray examination revealed that a flake of bone had been avulsed from the femur by the internal lateral ligament (see Figure III). A back plaster splint, extending from the upper third of the thigh to just above the ankle, was applied with two circular plaster bandages and the patient was allowed to walk about for a period of eight weeks. Since that time he has had practically no disability. Figure IV shows the fragment to be firmly united.

The radiological interpretation of an injury of this type is often debatable. It may be due to separation of the internal lateral ligament from the medial epicondyle of the femur with avulsion of a bony scale (Steida), or to a tear of the periosteum in consequence of a tearing-out of the internal lateral ligament, or to a partial tear of the tendon of the *adductor magnus* (Preisser). A shadow, apart from detachments of the bone, is radiographically visible, at the earliest, three weeks after the accident. If demonstrated radiographically immediately after the accident, it could be due only to avulsion of a flake of bone.

Rupture of Ligaments.

Firm union of torn ligaments is usually obtained without any operation if the limb is kept at rest for a sufficiently long period. There are now few surgeons who would operate on a case of recent rupture of the cruciate ligaments. The relaxed joints of old cases of this type are usually the result of inadequate, or too short, immobilization, owing to the fear of a stiff joint.

Hilton, who many years ago emphasized the value of rest in the repair of injured tissues, may be quoted in this connexion:

> Rest is the necessary antecedent to the healthy accomplishment of both repair and growth; this surely is a means towards an end, which should never be lost sight of by the physician or surgeon.

To obtain firm union in the repair of ligaments, six to ten weeks are necessary, and no strain should be thrown on the ligaments during the period of healing. There should be complete physiological and mechanical rest. Immobilization for an insufficient period, from fear of promoting a stiff joint, often leads to laxity of ligaments and permanent disability. In this connexion, however, Sir Robert Jones has pointed out that prolonged rest of a healthy joint, within the limits of its normal range of movement, will not give rise to more than a temporary stiffness.

In the treatment of injuries to the ligaments and of fractures involving the knee joint, Lorenz Böhler goes farther and combines continuous and uninterrupted immobilization in a plaster cast with active functional use of the limb, with admirable results. The patient walks about and carries out systematic exercises. He states that patients treated by this method do not develop atrophy of muscles and bone, circulatory disturbances in the affected limb, or stiffness of joints. Anyone who has visited his clinic cannot but be impressed by the results of this treatment. The patients appreciate being able to walk about, rather than being confined to bed; they are not altogether invalids, but convalescents, during the course of their treatment.

Muscles that do not function undergo atrophy. With the treatment mentioned above, the muscles of the affected limb, by active contraction, maintain their tone and wasting does not occur. The circulation to the limb is not defective, the muscle capillaries, which, during inactivity, are collapsed, dilate during exercises. Physiologists have shown that skeletal muscles during exercise may receive eighteen times their resting blood flow. Active contraction of muscle is one of the most important factors in aiding the venous return, consequently venous stasis and œdema are less likely to result if functional activity of the affected limb is carried out.

The surgeon should be ever mindful that the primary functions of the lower limb are weight-bearing and progression, for which stability and mobility are essential. The object of treatment should be to obtain a stable knee joint, without any deviation of its axis, and with the greatest mobility.

Rupture of the Lateral Ligaments.

The internal lateral ligament may be stretched or torn in its superficial and deep fibres or the superficial fibres may be torn across at their point of attachment to the femur or tibia. A piece of bone may be avulsed from the femur, producing a "fracture sprain" (see Figure III).

The deep fibres, which are attached to the internal semilunar cartilage, may or may not be torn; they play an important part in the mechanism of injury to the internal semilunar cartilage. Rupture of the internal lateral ligament may be caused by strong rotation and angulation at the joint when the lower leg is firmly held. The more severe types of rupture are caused by a force applied directly to the lateral aspect of the knee joint, when the foot is firmly fixed on the ground. Rupture of the external lateral ligament rarely, if ever, occurs by itself, but often does so in dislocation of the knee joint. If the point of maximum tenderness over the internal lateral ligament is at the site of its attachment to the tibia or femur, then rupture of some of its fibres has taken place at one of these situations. If the site of tenderness is at the level of the joint, however, then the deep fibres attached to the cartilage have been torn. No history of locking is obtained, and the pain is not so excruciating as in cartilage injuries. Pain is experienced on bracing the knee, which renders the ligament tense, and is increased by abduction of the leg. The integrity of the cruciate ligaments should always be tested (since injuries to ligaments are often multiple) and, finally, an X ray examination should be made to exclude fracture of the tibial spine.

The treatment is simply to provide for mechanical and physiological rest, combined with functional activity of the limb, for a sufficient time to allow the ligaments to unite. This can best be carried out by immobilization in an ambulatory, non-padded plaster, extending from the upper third of the thigh to just above the ankle. It is advisable to line the upper and lower margins of the plaster with a cuff of soft felt to prevent rubbing of the skin. An Unna's paste sock should also be fitted, to prevent swelling of the foot. The plaster should be well moulded around the knee joint to give firm support and to prevent lateral bending. In mild cases, six to eight weeks' immobilization is sufficient, but in the more severe cases, with marked abduction at the knee joint, ten weeks are necessary. The knee joint should be fixed comfortably in extension: any hyperextension will permit the ligaments to be elongated and relaxed. Even in neglected cases much may be gained by immobilization, as Case II shows.

Rupture of the Cruciate Ligaments.

Rupture of the cruciate ligaments may occur independently, but may be associated with the rupture of other ligaments. A common condition is rupture of the internal lateral and anterior cruciate ligaments following on force being applied laterally to the knee joint, as in Case III.

To produce rupture of both cruciate ligaments, extreme violence is necessary, which often, at the same time, produces complete dislocation of the knee joint.

The mechanism of the rupture of the anterior cruciate ligament is not constant. It may be produced by forward displacement of the tibia in hyperextension, with or without avulsion of the tibial spine,[1] to the anterior surface of which some of its fibres are attached. In the position of complete extension, the stability of the knee joint is maintained by tension of the anterior cruciate and internal lateral ligaments. An injury of the above type to the anterior cruciate ligament is often associated with stretching or tearing of the deep fibres of the internal lateral ligament.

Hogarth Pringle produced rupture of the anterior cruciate ligament experimentally in the cadaver, by abducting and rotating the leg, with the knee flexed and the pelvis fixed. He considered that internal rotation was the most important factor in producing the rupture, but that once its fibres had begun to tear, abduction played a part by drawing the ligament across the sharp lateral margin of the internal condyle. It was found in all such cases that the deep fibres of the internal lateral ligament were also torn.

Rupture of the posterior cruciate ligament alone is a very rare accident, but it can be produced by displacement of the tibia upwards and backwards with the knee flexed. The most severe types of rupture of the cruciate ligaments occur in dislocation and fracture-dislocations of the joint. When a fracture extending into the knee joint is present, injury to ligamentous structures should always be suspected. If neglected, they of themselves may be the cause of considerable disability from laxity, even though the fracture has healed in good position (see Case IV).

The treatment, again, is mechanical, allowing physiological rest to the knee joint in the extended position after the effusion has disappeared. This is achieved by application of a plaster cast, combined with active use of the limb. Early movement and massage are harmful and lead to instability.

The following cases are illustrative of ligamentous injuries.

CASE III. *Subluxation of Knee Joint with Rupture of Internal Lateral and Anterior Cruciate Ligaments.*—A male, aged twenty-five years, was thrown out of a motor car and admitted to the Royal Prince Alfred Hospital on May 7, 1933, suffering from a comminuted fracture of the right femur at the junction of its upper and middle thirds, and a lacerated wound of the right thigh, hæmarthrosis of the left knee joint with rupture of the internal lateral ligament and anterior cruciate ligament, and a complete common peroneal nerve palsy on the left side. There was abnormal mobility of the left knee joint, abduction being possible in the extended position, from 30° to 40° beyond the normal, as far as could be reasonably ascertained, in comparison with the right. The tibia could be displaced forwards on the femoral condyles over a range of more than 2·5 centimetres (one inch). The patient was treated by skeletal traction applied to the right femur and complete rest of the left knee joint in a plaster cast for three months. He was discharged on August 15, 1933, in a walking caliper for the right leg, and with a calf band and toe spring for the left leg, on account of the foot drop.

At the present time he has very little disability referable to the left knee joint, due undoubtedly to rest and absolute immobilization in plaster for a period of three months. He has also complete regeneration of the common peroneal nerve.

[1] Avulsion of the medial spine of the tibia by the mechanism of hyperextension as described by Sir Robert Jones probably does not occur. It is more likely that in hyperextension of the knee joint the fracture results from a shearing off of the spine by the more curved anterior portion of the medial condyle, after the anterior cruciate ligament and the deep fibres of the internal lateral ligament have given way.

CASE IV. *Subluxation of the Knee Joint with Ruptured Ligaments.*—On September 1, 1934, a female, aged fifty years, was struck on the lateral aspect of the left knee joint by the bumper-bar of a car. She was admitted to the Royal Prince Alfred Hospital suffering from subluxation of the left knee joint with rupture of the internal lateral and cruciate ligaments. Abduction was present to 40° in the extended position of the joint, while the head of the tibia could be moved in an antero-posterior direction on the condyles of the femur over a distance of about 3·75 centimetres (one and a half inches). A plaster cast was applied, with the limb in its correct axis. On account of lack of personal cleanliness and the truculent attitude of the patient, it was considered advisable to remove the plaster after two weeks and discharge her in a walking caliper. She was not seen again until September, 1935, when she reported to hospital, being unable to walk except with the aid of crutches. Her walking caliper was worn out and offered no support. She had an absolutely flail knee, clinically resembling a Charcot's joint (see Figures V and VI). The Wassermann test and the Kline precipitation test gave no reactions.

In Case III, where continuous and uninterrupted immobilization was carried out for a period of three months, the ligaments of the knee joint healed and the knee joint became stable.

In Case IV, where immobilization was not carried out, the ligaments healed in a stretched and relaxed condition. Recurrent displacements, due to slight movement which occurred during activity in a walking caliper, allowed strain to be thrown on the other intact ligaments of the knee joint, until finally, under stress, they too became elongated and relaxed, the knee joint becoming flail to such a degree that arthrodesis is the only surgical procedure that can offer any hope of relief.

CASE. V. *Rupture of the Anterior Cruciate and Internal Lateral Ligaments of the Left Knee Joint.*—A male, aged twenty-one years, was admitted to the Royal Prince Alfred Hospital on September 9, 1935. He was riding a motor cycle, when he ran into the side of a motor car, striking his left knee against the right front mud-guard; he was thrown across the bonnet, hyperextending the left knee joint. He incurred a lacerated wound, anterior to the patella, with rupture of the anterior cruciate and internal lateral ligaments. There was considerable hæmarthrosis. On September 10, 1935, 80 cubic centimetres of blood were aspirated from the joint, and a compression bandage was applied. On September 20, 1935, a back plaster splint was affixed, and the patient was allowed to walk. He was discharged from hospital on September 23, 1935.

On November 7, 1935, he had no muscular wasting, a full range of movement in the knee joint, and no lateral instability, but the tibia could be displaced slightly anteriorly in the extended position. He does not feel any disability referable to the knee joint.

CASE VI. *Fracture Dislocation and Rupture of Ligaments.*—A male, aged thirty-seven years, fell out of a cart, and the horse rolled on top of him. There was a fracture separating the lateral condyle of the tibia and extending into the knee joint. The shaft, medial condyle and intraarticular eminence of the tibia, which were intact, were dislocated laterally and forwards. The lateral condyle was displaced laterally. (See Figures VII and VIII.) The cruciate ligaments were ruptured, as demonstrated by the fact that the upper end of the tibia could be displaced to a marked degree forwards in the extended, and backwards in the flexed, positions. Both the internal and external lateral ligaments were also ruptured. There was considerable hæmarthrosis.

The limb was immobilized in a back plaster splint and a compression bandage was applied to the joint for a period of ten days until the effusion had subsided. The fracture was reduced, the condyles of the tibia were compressed by means of a Böhler's compression clamp, and a thin plaster cast was applied from the toes to the groin. A walking iron was applied and the patient was allowed to walk and carry out systematic exercises. After ten weeks, when the plaster was removed, the knee joint was found to be stable, with about 20° of movement. Massage, diathermy to the knee joint, and active movements were then commenced with a view to increasing the range of movement. The patient is still under treatment. Figures IX and X show the X ray appearance of the joint twelve weeks after reduction of the fracture-dislocation.

Avulsion of the Quadriceps Insertion.

Avulsion of the quadriceps tendon from its insertion into the upper margin of the patella by muscular action may occur, the mechanism being similar to that which produces a fracture of the patella.

CASE VII.—A male patient was admitted to the Royal Prince Alfred Hospital in 1926, having slipped on a stick whilst getting off a dray. He had avulsion of the quadriceps tendon from the upper margin of the patella. X ray examination showed no fracture. An operation of fixation of the detached quadriceps insertion to the patella, with interrupted kangaroo tendon sutures, was performed, but was a failure. Twelve months later a second and similar operation was carried out with apparent success; the weak union obtained gradually stretched, and at the present time a gap exists between the patella and the detached quadriceps tendon. The patient has little power of extension at the knee joint.

Injury to the Ligamentum Patellæ.

Injuries to the patellar ligament are usually of the nature of incised or lacerated wounds. Avulsion of the insertion of the *ligamentum patellæ* is of rare occurrence. The following constitutes an unusual type of injury to this ligament.

CASE VIII. *Injury to the Ligamentum Patellæ.*—A male, aged twenty-one years, was admitted to the Royal Prince Alfred Hospital on September 22, 1934. He was riding a motor cycle when he ran into a lorry, was thrown, and skidded along the asphalt road. The skin, practically all the *ligamentum patellæ* and part of the tibial tubercle were rubbed away, the infra-patellar pad of fat being exposed. The tibial tubercle, which was very dirty, was removed at operation, together with frayed portions of the *ligamentum patellæ*. The scanty remains of the *ligamentum patellæ* were sutured together and to the periosteum in the region of the tibial tubercle. The wound healed by first intention, and the patient now has full range of movement at the knee joint.

Fractures.

Fractures extending into joints constitute serious forms of injury, particularly so when the fracture involves the knee joint. They should always be suspected, and great care should be exercised in their diagnosis. After any injury to the knee joint, where function is interfered with, an X ray examination should always be carried out.

It is most important also to recognize associated injuries. The common peroneal nerve injury of Case III could easily have passed unnoticed by the casual observer.

It is very disconcerting, and does not add to the reputation of the doctor, whose attention in an accident case is focused on a fracture, to be told by a nurse that the patient has foot drop (resulting from an injury to the common peroneal nerve) or has hæmaturia (arising from a contusion, or rupture of the kidney).

It is essential always to examine the patient in detail; not merely the injured part or the affected limb.

Fracture of the Medial Spine of the Tibia or Inter-Condylar Eminence.

The inter-condylar eminence is situated between the two condylar articular surfaces on the upper end of the tibia. The two articular surfaces are prolonged

upwards into the middle of the joint to form the medial and lateral tubercles, which vary greatly in size in different individuals. In some they are small tubercles and hardly recognizable, while in others they are well developed and lend themselves to fracture (see Figure I).

Fracture of the spine of the tibia may occur, with or without rupture of the anterior cruciate ligament. Avulsion of the spine, together with rupture of the anterior cruciate ligament, has already been described as being due to forcible hyperextension.[1] It may also occur in association with fracture of the upper end of the tibia into the knee joint. The medial tubercle may be sheared off, should flexion, abduction and rotation of the tibia occur, being fractured by the outer edge of the medial condyle. Sometimes the lateral tubercle is sheared off by the medial edge of the lateral condyle. The clinical features in these cases are hæmarthrosis and inability to extend the knee fully. The pain is felt within the joint and, in uncomplicated cases, no abnormal mobility is detected. The same mechanism may produce concurrent injuries to the internal lateral and anterior cruciate ligaments, the integrity of which should always be tested. The inter-condylar eminence itself may be separated and, if displaced, it may constitute a bony block, limiting extension, which, if unreduced, seriously impedes the usefulness of the joint.

When complete extension is present, immobilization of the joint in a posterior plaster splint for six weeks, combined with functional activity of the limb, as in walking and systematic exercises, constitutes the best form of treatment. When there is associated injury to the ligaments, immobilization should be for a longer period. When full extension is not possible, manipulation under anæsthesia, preceded by aspiration of the joint, if necessary, is the treatment recommended. In the majority of cases reduction can be accomplished, and only if this fails should open operation be resorted to. Bony union may be obtained if the separation is not great and if immobilization has been carried out, otherwise fibrous union or non-union results. Bony union may occur, even after a long interval, as in Case I.

Fractures of the Upper End of the Tibia Extending into the Knee Joint.

All fractures into the knee joint with much displacement are associated with some injury to the ligaments. These, of themselves, should receive serious consideration if a stable knee joint is to be obtained. If, after a severe fracture involving the knee joint, the joint is stable in the extended position, and can be moved to 60° or 90°, it will be much more useful than if complete extension were not possible, and a greater range of movement were present. If complete extension of the knee joint is not present, standing is possible only by contraction of the quadriceps, which must be kept in constant tension.

When the knee joint is flexed, any distortion of its axis can be recognized only with difficulty. One is often surprised to see how much deviation of the axis, that is, a varus or valgus deformity, is present after straightening a limb which has been treated in flexion for a fracture of this type.

I have seen a young boy, who had been treated in flexion for a fracture of the upper end of the tibia, involving the knee joint. The skiagram appeared satisfactory, but, on extension of the knee joint, at the completion of treatment, the deviation of the axis of the limb was so pronounced that a subsequent osteotomy was necessary.

It is essential in all cases to obtain as perfect a reduction as possible, because osteoarthritis often follows any alteration in the mechanical arrangement of the knee joint.

Fracture of the medial or lateral condyle of the tibia may occur as a result of compression by force applied in a vertical direction, as in falls from a height. Abduction breaks off the lateral condyle; or the medial condyle is broken off by adduction.

Fracture of the lateral condyle is of common occurrence, the body weight being transmitted more through the lateral than the medial condyle of the tibia. The condyle is usually depressed, abduction occurring at the knee joint, with injury to the internal lateral ligament. Abduction cannot occur in a fracture of this type unless accompanied by a tearing of the internal lateral ligament. A similar type of fracture may be produced by the direct blow of a bumper-bar against the outer aspect of the leg.

Should adduction occur, as in falls from a height, fracture of the medial condyle results with injury to the external lateral ligament, and the outer part of the capsule.

If fractures of this nature are allowed to remain unreduced, a varus or valgus deformity results, with permanent disability. It is important in reduction to pay attention to the following points: (i) The normal axis of the limb should be restored. (ii) The depressed condyle should be elevated to the normal level. (iii) The widening of the upper end of the tibia should be corrected.

In fractures of the lateral condyle the leg should be adducted, as far as possible (that is beyond the normal axis); the depressed condyle, which is held by its own lateral ligament, is usually brought to the correct level of the upper end of the tibia by this manœuvre. If it is not, direct local pressure should be exerted, or the condyle should be elevated by means of a Steinman's pin inserted beneath its lower margin. The condyles should be compressed, and, finally, the leg restored to its normal axis. The reverse manœuvres should be carried out in the case of a fracture of the medial condyle.

An ambulatory, non-padded plaster should then be applied, extending from the toes to the groin; this accurately immobilizes the fracture and prevents recurrence of the displacement. Since no shortening can occur, a walking iron should be fitted and the patient allowed to walk. The plaster should remain on for ten weeks. If union is firm, clinically and radiographically, the plaster cast is removed and the patient allowed actively to bend the joint. In some cases a longer period of immobilization is necessary, otherwise deformity may occur under weight transmission. If the patient has carried out his exercises

[1] See footnote, page 224.

conscientiously and walked about, one is often surprised to find how much movement exists at the knee joint on removal of the plaster. Active exercises gradually increase the range of movement, and good function is restored.

Even in elderly people good results may be obtained provided that functional activity of the limb is maintained during the period of immobilization. The following case illustrates this:

CASE IX. *Fracture of the Upper End of the Tibia and Fibula with Fracture of the Lateral Condyle, Extending into the Knee Joint.*—A male, aged seventy years, suffering from pernicious anæmia, fell down some steps, incurring a fracture, more or less transverse, of the upper end of the tibia and fibula, with a fracture of the lateral condyle of the tibia extending into the knee joint (see Figures XI and XII). After ten days, when the effusion of the knee joint had disappeared, an ambulatory, non-padded plaster, extending from the toes to the groin, was applied and a walking iron was fitted. After ten weeks the plaster was removed and nearly 60° of movement was found to be present at the knee joint. The range of movement rapidly increased with active use of the knee joint. I am informed that he now has full range of movement and a stable knee joint.

In T- or Y-shaped fractures of the upper end of the tibia the shaft is driven upwards between the condyles and shortening results, with splaying apart of the tibial condyles and extensive ligamentous damage. Reduction is possible only after the wedge-shaped tibial shaft, driven between the condyles, has been pulled out by powerful traction, and the condyles pressed together. In reduction of fractures of this nature attention should also be paid to the same three points mentioned above in connexion with fractures of a condyle of the tibia, with the addition that the shortening must be corrected.

The leg should be immobilized and extension applied. Walking in an ambulatory plaster can be commenced only after sufficient union has occurred to prevent splaying apart of the condyles by the upper end of the tibial shaft, under the influence of weight transmission; this usually takes six weeks. An ambulatory plaster with a walking iron should then be applied for a further six weeks. If clinically and radiographically union is firm, active use of the joint can be commenced; otherwise a further period of immobilization is necessary.

CASE X. *Y-Shaped Fracture of the Upper End of the Tibia, Extending into the Knee Joint, and Open Fracture of the Fibula.*—A man, aged thirty-nine years, was knocked down on August 10, 1935, by a motor bicycle, which struck him on the outer side of the right leg. He had a Y-shaped fracture of the upper end of the tibia, extending into the knee joint, with an open fracture of the neck of the fibula (see Figures XIII and XIV). Under local anæsthesia, *débridement* of the wound, with primary closure and reduction of the fracture in a screw traction apparatus were carried out, a Steinmann's pin having been inserted in the *os calcis*. The limb was put in plaster and 3·2 kilograms (eight pounds) weight extension was applied. The leg was supported on a Braun splint. After six weeks an ambulatory plaster with a walking iron was applied. At the present day, after twelve weeks, he still has delayed union, and a further period of immobilization is necessary.

Figures XV and XVI show an unusual type of fracture of the upper end of the tibia extending into the joint, in a patient suffering from Paget's disease.

This patient slipped, bumping the upper end of his tibia against a step. He incurred a fracture separating the tibial tubercle, and extending into the knee joint. Fibrous union only took place. Twelve months later he again injured his knee at work, receiving a separation of the same fragment. He has been treated by immobilization in a back plaster splint under the principles already laid down, and now has full range of movement at the knee joint.

Fractures of the Lower End of the Femur Involving the Knee Joint.

The medial or lateral condyle of the femur may be fractured and displaced upwards, the leg assuming a varus or valgus position. There is always a considerable effusion of blood into the knee joint, and there may be associated injury to the cruciate ligaments. The displacement is readily corrected by bending the leg in the opposite direction to the broken condyle. By this manœuvre the condyle, which was displaced upwards, is drawn down by the intact lateral ligament. These fractures should be reduced as soon after occurrence as possible. Immobilization should be carried out for a period of eight weeks before the application of a walking caliper. Too early weight-bearing may lead to a varus or valgus deformity. The caliper is retained for six months from the date of the fracture.

In all early cases reduction can usually be effected, and the condyles compressed. Fixation by open operation has occasionally to be resorted to in difficult cases.

When both condyles are broken off (Y- or T-shaped fractures), there is always considerable effusion of blood into the knee joint, and often serious damage to both cruciate and lateral ligaments. These constitute serious types of fractures. Accurate reduction and absolute immobilization must be carried out if a stable joint is to result. Reduction should be effected by application of extension and compression of the condyles. Immobilization should be for a period sufficient to allow of union and repair of torn ligaments—eight to ten weeks. A walking caliper is then applied. Full weight bearing should be prevented for at least six months, but in the meantime the caliper should be removed so that active exercises can be carried out in order to restore as much movement as possible to the knee joint.

CASE XI. *Fracture of the Skull. Fracture-Dislocation of the Knee Joint with Extensive Damage to the Ligaments.*—A male, aged fifteen years, the victim of a motor cycle accident, was admitted to Royal Prince Alfred Hospital on January 10, 1931, unconscious, and suffering from a fractured skull and a fracture-dislocation of the left knee joint. There was a fracture of the lateral condyle of the femur, and a fracture of the medial spine of the tibia. The tibia, together with the lateral condyle of the femur, was displaced posteriorly and laterally, so that the medial condyle of the femur presented itself as a visible projection anterior and medial to the upper end of the tibia. Practically all the ligaments of the knee joint were torn. Hæmarthrosis was marked. The dislocation was reduced and the patient was treated by skeletal traction. Immobilization was carried out for three months. At the present day he has a moderately stable knee joint, with very slight lateral instability. Full extension is present at the knee joint, with flexion to 90°. He is able to carry out his occupation, as a motor mechanic, without inconvenience. Figures XVII and XVIII (1935) show the lower end of the femur to be practically normal in outline. A cystic appearance indicates the original line of separation of the lateral condyle of the femur. New bone formation on the medial aspect of the medial condyles of the femur and tibia is the result of extensive stripping up of the ligaments and periosteum at the time of injury.

Fractures of the Patella.

The patella may be fractured by direct violence or by muscular action. Fractures by direct violence are usually star-shaped or fissure fractures, without

displacement. A compression bandage should be applied to limit effusion. As soon as the swelling has disappeared, these fractures should be treated by immobilization in a posterior plaster splint, bandaged to the leg by one circular plaster bandage. The patient is allowed to walk and actively to use the affected limb. After four weeks the plaster may be removed, and active movements of the knee joint carried out.

In fractures caused by muscular action the patella is fractured across the upper margin of the trochlear surface of the femur. There is wide separation of the fragments, and the expansions of the vasti muscles are torn; that is, the whole extensor mechanism is severed. These fractures require operative intervention. The frayed portions of periosteum and quadriceps tendon that lie between the fragments should be removed. If only the capsule and torn expansions of the vasti muscles are sutured, the after-treatment should be the same as that indicated above for fractures without separation. Should the fragments be drilled and sutured together, active movements of the knee joint may be commenced as soon as the wound has healed.

The following case is of interest on account of the patient's having a fracture and refracture of the patella, for which two operations were performed, each with a good result.

CASE XII.—A male, aged twenty-one years, was admitted on July 26, 1928, to the Royal Prince Alfred Hospital suffering from a fractured right patella, incurred whilst playing football. An operation was performed on August 3, 1928, and the patella was sutured with kangaroo tendon. The patient was discharged on September 12, 1928, with full range of movement in the knee joint. He was readmitted on September 26, 1928, having fallen down some stairs and re-fractured his patella. A second operation was performed on October 3, 1928, similar to the first. He was discharged on November 15, 1928, with a full range of movement in the knee joint, and has had no disability since. Figure XIX (1935) indicates a normal joint, except for some rarefaction at the lower third of the patella.

Summary.

A study of a series of cases like the foregoing emphasizes the importance of the following points:

1. A knowledge of the structure, function and pathology of the knee joint is essential for the correct interpretation of its injuries and for the institution of adequate treatment.
2. Diagnosis must be accurate, and the surgeon must avoid the vague nomenclature of such terms as synovitis until more serious forms of injury are excluded.
3. Routine X ray examination of the knee joint is essential.
4. The therapeutic aim should be the establishment of a stable knee joint in the extended position with the greatest mobility possible.
5. The essential treatment is rest to the joint, combined with active use of the limb, which is best carried out by immobilization in an ambulatory non-padded plaster.

Acknowledgements.

I am indebted to members of the honorary surgical staff of the Royal Prince Alfred Hospital for permission to report and demonstrate patients admitted under their care.

Bibliography.

F. G. Parsons: "The Joints of Mammals Compared with Those of Man", *Journal of Anatomy and Physiology*, Volume XXXIV, page 301.
Arthur Keith: "Human Embryology and Morphology".
M. A. MacConnail: "The Function of Intra-articular Fibro-cartilages, with Special Reference to Inferior Radio-Ulnar Joint", *Journal of Anatomy*, Volume LXVI, page 210.
Hilton: "Lectures on Rest and Pain".
Robert Jones: "The Problem of the Stiff Joint", *The British Medical Journal*, December, 1931, page 1019.
W. A. Cochrane: "Orthopædic Surgery".
Samson Wright: "Applied Physiology".
Robert Jones and S. Alwyn Smith: "On Rupture of the Crucial Ligaments of the Knee and on Fractures of the Spine of the Tibia", *The British Journal of Surgery*, July, 1913, page 70.
Maxwell Harbin: "A Consideration of Certain Derangements of the Knee Joint", *Surgery, Gynecology and Obstetrics*, August, 1928, page 155.
Köhler: "Rontgenology".
Lorenz Böhler: "The Treatment of Fractures".

INTERNAL DERANGEMENTS OF THE KNEE JOINT.[1]

By McCLEMENTS CALLOW,
Honorary Assistant Orthopædic Surgeon, Royal Prince Alfred Hospital; Honorary Consultant Orthopædic Surgeon, Marrickville Hospital; Honorary Orthopædic Surgeon, Parramatta Hospital.

IN preparing this communication I have made it my aim to give you certain facts and opinions of mine that may be of use to you in your practice, and have accordingly avoided an academic consideration of the subject. The facts are the findings in six hundred cases of arthrotomy of the knee joint, mostly for injury to the meniscus of the knee joint; and my opinions are based on these observations, as well as on the results of clinical and radiographic examination of many hundreds of cases. In addition to my own cases I have used the case histories of Dr. Lennox Teece, but I have used only the histories of those patients at whose operation I was present. My thanks are due to him for permission to use these histories.

I would point out first of all that we must always be on the look out for inflammatory conditions that are brought to light by means of some injury. A tuberculous joint and even an acute suppurative arthritis has been mistaken for a non-inflammatory traumatic condition because the patient stated that it was first noticed after an injury. Careful consideration of the history of the case and the results of clinical examination will, however, decide the point.

It will be best, and I hope most helpful to you, if my remarks are confined to a consideration of traumatic synovitis of the knee joint, a very common and very difficult problem. It must be borne in mind that synovitis is merely a sign and not a disease in itself. It is as a rule just as wise to tell a patient that he has a pain in the abdomen as to tell him that he has synovitis of the knee joint. The degree of violence to which the knee joint may be subjected without any pathological result is extremely variable, and depends mainly on two factors, and these are closely related. The first and most important is the strength and tone of the muscles controlling the knee

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on November 28, 1935.

joint, and the second is the readiness of the person to accept the injury. This is excellently illustrated on the football field. The player has good muscular development, and is always ready to take a knock. I do not wish to give the impression that injuries to the knee in footballers are rare, because they are actually frequent, but the wonder is that there are not a dozen serious knee injuries in every match. The strength of the knee depends mainly on the strength of the muscles, particularly of the *quadriceps femoris*, and this fact must be borne in mind continually during examination and treatment, because we can say definitely that, if there is anything wrong with the knee joint, there are always loss of tone in the quadriceps and a diminution of circumference of the thigh. This is a generalization, and includes conditions both traumatic and inflammatory, acute and chronic. It must not be thought that the ligaments are of no account, but I am referring particularly to the different amounts of violence that different men can withstand apparently with impunity.

The cases that cause us most trouble are those of recurring increases of synovial fluid in the knee joint after an injury, often apparently trivial, with or without other signs. If there are no inflammatory signs, if there is no fracture, and if there is no evidence of osteoarthritis, we can generally say that these cases are due to an internal derangement of the knee. In other words, in an active man the knee with repeated effusions of synovial fluid practically always contains a torn meniscus. The idea that synovial fringes may be nipped between the articular surfaces of the femur and tibia in a healthy joint is, in my opinion, purely a flight of fancy.

A typical history of tearing and displacement of the medial meniscus is as follows: The knee is subjected to a twist while bearing weight, and generally in the flexed attitude; there is a sharp sudden pain on the inner side of the joint, and often a feeling that something has torn or come out of place. After a few minutes the man finds that the joint cannot be moved and, if he walks, he can merely hobble about with only the toe on the ground. After the most severe pain has passed he finds that more flexion is possible, even if painful, but that extension is not possible and is very painful if forced. He may himself, or a friend may for him, move the leg about to make it more comfortable, and then there is another sharp pain, with perhaps a click or snap, and extension is restored and the pain is relieved. Excess synovial fluid is obvious in a few hours, but there is as a rule no bruising. Examination then shows excess fluid, all movements are painful and restricted by the tension in the joint, and there is an area of tenderness over the antero-medial aspect of the joint line. After a few days' rest the fluid decreases in amount, but there is some wasting of the thigh and the tenderness may remain for some weeks. With this history the diagnosis will not be missed, but very often the locking and unlocking take place practically together, so that it is really only a momentary displacement, and in such cases the definite history is not obtained.

We must never accept the statement that a joint became locked without very carefully ascertaining exactly what is meant; many a man says that his knee is locked when actually it is merely too sore to move. The really typical and diagnostic feature is the unlocking with relief of pain. The typical case is fairly common, but I think the great majority are those in which the displacement is momentary, so that the history of locking, and especially unlocking, are not present. In these circumstances the history is as follows: An injury is sustained to the flexed knee, accompanied by severe pain on the inner side; the knee is too sore to be moved freely, but after the initial severity of the pain has lessened it is found that the knee can be moved fairly freely, synovial fluid becomes much increased, and the tension makes movement painful and limits its range. There is a point of maximum tenderness over the antero-medial aspect of the joint line. Two or three weeks' rest allows the swelling and pain to abate and the man resumes work with a leg still feeling unreliable and weak and with some atrophy of the corresponding quadriceps muscle. As soon as the leg is caught in an unfavourable attitude there is a return of the pain, and again the joint becomes painful and work is impossible or at least very difficult. This may continue for months with the man working for a few days or weeks and then being forced to rest, and always with a leg that he distrusts and has to protect. If we exclude inflammatory conditions and the presence of a loose body, we can be practically certain that the medial meniscus is torn and abnormally mobile.

Being a firm believer in standardization, both in examination and treatment, I have adopted the following procedure in examining the knee joint. Again I do not wish to be misunderstood. We cannot all be regarded as machines, and must not treat our patients as such. However, a definite systematic examination and method of treatment mean that no detail will be missed. The man removes his trousers (and this is probably the most important step in the examination) and sits on the examination couch with both legs extended and fully exposed from groins to toes. A glance shows presence of scars, deformities, varicose veins or other defects. The sound leg is examined for range of movement and evidence of osteoarthritic signs. It is then noted if there is redness, local heat, or thickening of the affected joint. The presence and degree of synovial excess is ascertained, and tenderness is located by pressure along and about the joint line. The range of movement is noted and a hand over the joint notes the presence or absence of crepitus. With the leg fully extended and the knee held firmly, the leg is pushed into the valgus and then varus position to ascertain if the lateral ligaments are intact, and with the knee flexed the tibia is pulled forward to note the integrity of the anterior cruciate ligament and backwards to test the posterior cruciate. The circumference of the thigh at a constant level is then noted and the power of the quadriceps is tested and compared with that of its fellow of the opposite side. While this is being done, we must note if there is any sensation noticeable either by surgeon or patient, such as a click or snap in the joint. The knee joint is then manipulated in various directions in an attempt to feel any mobility of the meniscus, and finally the

patient stands on the floor and again the joint is manipulated while weight is borne on the leg, and particularly with the knee slightly flexed.

A radiographic examination is always made because similar symptoms may be caused by a loose body or by a fracture of the spine of the tibia.

An unusual and interesting case was instrumental in making me insist on an X ray examination.

I examined a girl of sixteen years with a typical history and clinical findings of a displaced medial meniscus. On opening the joint, I saw a fragment of bone resting on the anterior end of the medial meniscus, and this proved to be a flake of bone from the upper surface of the tibia, quite free except for its attachment to the anterior cruciate ligament. This was removed, the ligament being left without its tibial attachment. There was a feeling of weakness in the joint for some weeks, and the tibia could be pulled forward on the femur for about two months, but stability was gradually restored and the joint appeared normal in six months.

Loose bodies due to osteochondromatosis or *osteochondritis dissecans* are sufficiently common to be kept in mind during examination, but I will not weary you by discussing the pathology of these conditions.

Very often it is possible to make a diagnosis of the type of tear in the meniscus before operation. If there are repeated definite lockings and unlockings, accompanied each time by a crack and usually painful, we suspect that there is a longitudinal split in the meniscus, this being the so-called bucket handle tear, so that there is a portion of the cartilage which is attached at both ends but which slips from its usual position along the circumference of the tibial head towards the intercondylar notch. If one end of the torn fragments is then completely detached a loose tag is formed, and the complaint is that there is the feeling of something slipping within the joint at every step. Detachment of the anterior and posterior horns does not give such definite indications, but is suspected if the symptoms are more noticeable with the knee in the extended or flexed attitude for the anterior and posterior horns respectively.

It will be seen now that, unless a definite movement of the meniscus can be felt, there is very little in the way of physical signs, so that the diagnosis depends on the history of slipping *et cetera* and of locking which is painful, and more especially of unlocking with relief of pain.

Of course even the history is not infallible.

I saw a case in which a distinguished surgeon had removed a medial meniscus and in which locking and unlocking of the joint continued. An extremely careful history and examination convinced me that there was still displacement of a meniscus, and I was forced to suspect the lateral. However, there was nothing definite to aid in localization, but still everything else had been excluded. At length the knee locked very obligingly at the end of the examination, and a glance then showed that the real trouble was a recurring dislocation of the patella.

The relative frequency of lesions of the medial and lateral meniscus are in my experience about eight to one.

Treatment.

The method of treatment to be adopted depends on the condition of the knee and the social condition of the patient. If there are repeated painful lockings, I think the meniscus should be removed unless there are definite contraindications such as the age of the patient.

It is wise for the original displacement always to replace the meniscus and to give about three weeks' rest, as there are occasional cases in which no further trouble occurs. However, it will generally be found that once there has been a definite displacement of the meniscus further displacements will follow, as healing does not take place.

In a young active man with more than one displacement my advice is always that operation should be done. This is imperative in men whose occupations are such that a suddenly locked knee would place them in danger. The condition which causes us to hesitate most is the presence of obvious osteo-arthritic signs in the knee. It is a matter of experience that a man with obvious lipping of the articular margins suffers a very tedious convalescence; but again we have to consider the fact that an osteo-arthritic knee is not improved by the constant and fairly severe traumata inflicted by the acrobatic meniscus. The wisest course when confronted with such a case is to take a holiday and send the patient to another surgeon. Again let me repeat, I think the occupation of the man should be the deciding factor in doubtful cases.

Before actually discussing the operation, it is best to consider the patient's almost certain question, "will the knee be stiff after the operation?" Fortunately we can reply quite confidently "no". We can assure the patient that he will be able to walk reasonably in two weeks, that he will be fit for a moderate amount of work in four or five weeks, and that any work can be done after six or eight weeks.

The operation itself, while not a difficult one technically, is a proceeding requiring particular care. With modern aseptic technique sepsis is a rarity, but even the mildest infection, that is one not proceeding to suppuration, is likely to cause considerable disability or at the least a greatly increased period of disablement.

I have seen cases in which a few days after the operation there has been an unusual increase in synovial fluid, with some thickening of the peri-articular tissues and tenderness of the joint and in the popliteal space. The temperature and pulse rate are both elevated, and the surgeon is depressed.

Fortunately in all my cases the condition has settled down with absolute rest, preferably in a Thomas bed knee splint. However, the time of recovering is much increased and the patient is inclined to lose faith. In two cases I have seen severe infection of the superficial tissues which settled down, and in both cases there was no disability at all as a result. I have not yet seen a suppurative arthritis as a result of removal of a meniscus. Loose bodies in the knee joint are not common, but must always be borne in mind. The treatment is, of course, to remove the fragment.

A very common mistake is for a sesamoid bone in the muscles of the popliteal region to be mistaken for a loose body. I have seen twenty or thirty patients who have been referred for removal of a loose body when the trouble is a torn medial meniscus. I should like to say, however, that such patients have always come without a radiographic report.

THE NEURAL COMPONENTS OF TERATOMATA.[1]

By R. A. WILLIS, M.D., D.Sc. (Melbourne), M.R.C.P. (London),
(From the Baker Research Institute, Alfred Hospital; and the Pathology Department, University of Melbourne.)

FROM recorded descriptions of teratomata, it is evident that the frequent presence of neural components in these growths has been insufficiently appreciated. It is the purpose of this paper to show that nearly all teratomata contain nervous tissues and to illustrate the great variety of these tissues.

Clearly, a proper estimate of the frequency with which particular tissues are present in teratomata can be made only when adequate examination of the tumours is carried out. The study of only a few sections taken at random from different parts of a growth is useless for this purpose. The present paper is based on the examination of twenty-two teratomata, by what may be called the serial slab method. In this method each specimen is cut into a series of slabs 0·5 to 1·0 centimetre thick; these are cut into numbered blocks of convenient size for making microscopic sections, and sections from every block are prepared and studied.

Frequency of Neural Components in Teratomata.

Table I shows the number and situations of the teratomata which I have examined in this way, and the number in which neural components have been identified.

TABLE I.

Situations.	Number of Tumours.	Number with Neural Components.
Teratomata of testis	9	6
Teratomata of ovary	8	7
Retroperitoneal teratomata	2	2
Mediastinal teratomata	2	2
Sacral teratomata	1	1
Total	22	18

NOTE.—Fourteen of these tumours have been described in detail elsewhere (Willis, 1935).

Thus in no less than eighteen of twenty-two teratomata neural tissues have been identified with certainty. Yet even this figure is probably an underestimate. The three testicular growths in which no neural tissues were identified contained rapidly growing elements, the specific identification of which was not possible, and which may have included unrecognizable anaplastic neuro-epithelial tissue. It is significant that, with the exception of one ovarian tumour, the only tumours in this series which have not been proved to contain nervous elements were malignant testicular teratomata in which there were rapidly growing components, some of which might have been neuro-epithelial.

It is worth noting that the so-called "dermoid" cyst of the ovary nearly always contains nervous tissues. Of the eight ovarian teratomata in this series, six were of the "dermoid" cyst variety, that is to say, one large skin cyst formed the bulk of each growth, the other elements of which formed a smaller mass lying to one side of, or projecting into, the

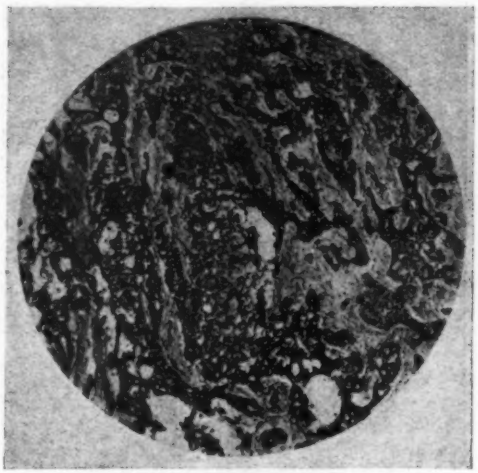


FIGURE I.

From a highly malignant teratoma of the testis, showing atypical neuro-epithelial growth resembling "adeno-carcinoma". × 45.

main cyst. It is in this lateral mass or eminence that the bulk of the nervous tissues is usually to be found, though they may also extend into the thinner walls of the dermoid cyst. Nervous tissue was present

FIGURE II.

From a teratoma of the testis. Near the centre of the field is a neuro-epithelial canal with commencing formation of a mantle zone, resembling that of an eight or nine weeks' embryo. × 45.

in five of the six teratomata of the "dermoid" cyst type in this series. Since nervous tissues, and other kinds of tissues, too, are usually present in the walls of ovarian dermoids, there is clearly no justification

[1] Read before the Section of Pathology at the annual meeting of the British Medical Association, Melbourne, September, 1935.

for the attempt to distinguish between teratomata and dermoid cysts. A dermoid cyst is merely a teratoma, one of the skin-lined cavities of which has grown to a relatively large size.)

FIGURE III.
From a mediastinal teratoma, showing a small mass of fully differentiated central nervous tissue with a central ependymal cavity. × 40.

Varieties of Neural Tissue in Teratomata.

As the following descriptions will show, nervous tissues of all kinds, mature or immature, may occur in teratomata. It will be convenient to consider separately the tissues representative of the central nervous system and of the peripheral nervous system.)

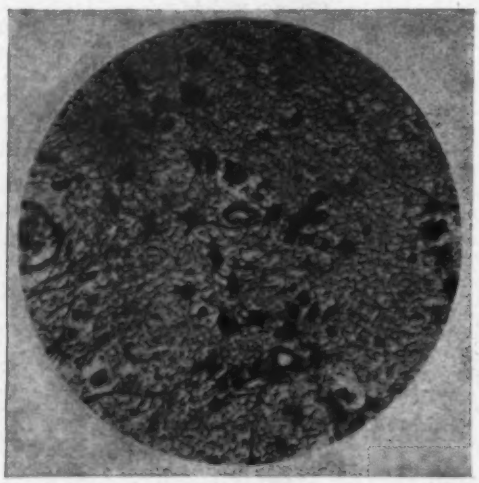


FIGURE IV.
From a mediastinal teratoma, showing well developed astrocytes plainly visible in an ordinary hæmatoxylin-eosin stained section. × 280.

Central Nervous Tissues.

Immature Central Nervous Tissues.—Immature central nervous tissues are often plentiful in actively growing malignant teratomata, especially those of the testis.) The least differentiated of these take the form of neuro-epithelial tubules, networks or papillary formations; some of these are difficult to distinguish from immature glandular structures,) for which

FIGURE V.
From a teratoma of the testis, showing well differentiated astrocytes stained by Cajal's gold-sublimate method. × 600.

indeed they have often been mistaken. Thus Wilms (1896), in his classical account of teratomata of the testis, stated that in none of the many tumours studied by him did he find nervous tissues; and from his description it is almost certain that he mistook for glandular structures the atypical neuro-epithelial

FIGURE VI.
Clumps of oligodendrocytes in the central nervous tissue of a mediastinal teratoma. × 55.

components which are so often present in these tumours. So also Dew (1925), in his account of testicular teratomata, makes only passing reference to the presence of nervous tissues in these growths;

ILLUSTRATIONS TO THE ARTICLE BY DR. JOHN S. MACMAHON.

FIGURE I.

FIGURE II.

FIGURE III.

FIGURE IV.

ILLUSTRATIONS TO THE ARTICLE BY DR. JOHN S. MACMAHON.

FIGURE V.

FIGURE VI.

FIGURE VII.

FIGURE VIII.

ILLUSTRATIONS TO THE ARTICLE BY DR. JOHN S. MACMAHON.

FIGURE IX.

FIGURE X.

FIGURE XI.

FIGURE XII.

FIGURE XIII.

FIGURE XIV.

ILLUSTRATIONS TO THE ARTICLE BY DR. JOHN S. MACMAHON.

FIGURE XV.

FIGURE XVI.

FIGURE XVII.

FIGURE XVIII.

FIGURE XIX.

and it is evident from his descriptions and illustrations that some at least of the tissues which he regards as of malignant entodermal nature are really neuro-epithelial.

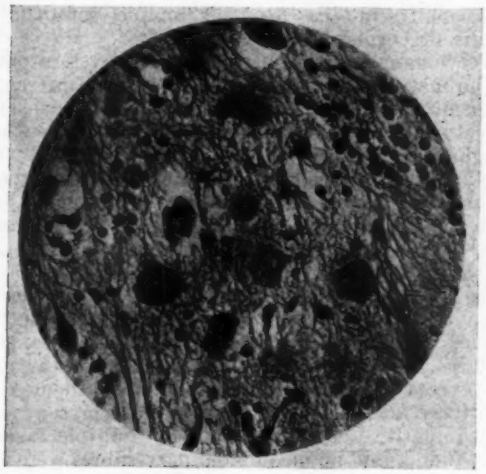


FIGURE VII.
From a "dermoid cyst" of the ovary showing fully differentiated nerve cells in central nervous tissue. × 280.

Sections of neuro-epithelial tubules in teratomata may closely resemble those of the neural tube of the early embryo; and there is clear structural evidence that, like the normal neural tube, teratomatous

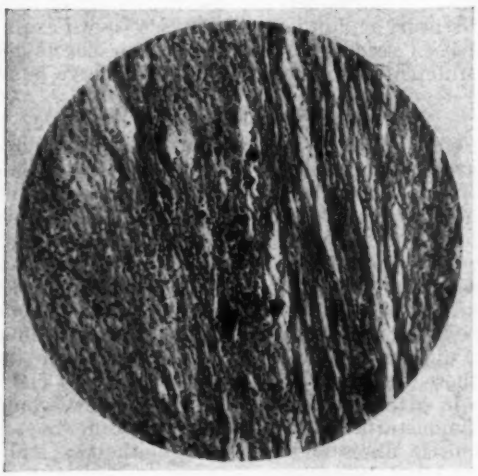


FIGURE VIII.
"Brain-sand" in the central nervous tissue of a mediastinal teratoma. × 65.

neuro-epithelium arises by infolding or delamination from undifferentiated epithelial surfaces, the remainder of which develops into stratified epithelium of epidermal type. Occasionally some of the neuro-epithelium in a teratoma shows heavy melanin pigmentation and closely resembles that of the developing optic cup.

A somewhat later stage of differentiation of immature central nervous tissue in teratomata is

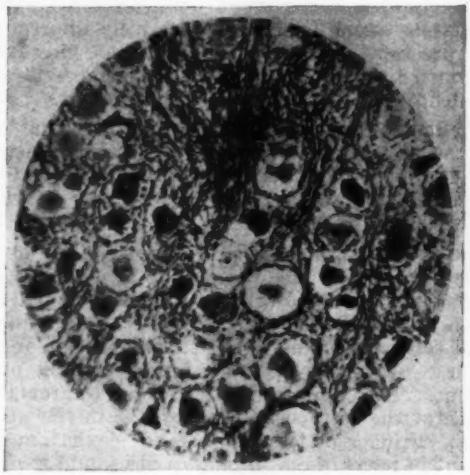


FIGURE IX.
From a "dermoid cyst" of the ovary, showing nerve cells and strands of non-medullated fibres in a ganglion. (Iron-hæmatoxylin stain.) × 150.

represented by masses of tissue resembling the mantle zone of the nervous system of an eight or ten weeks embryo, containing canals with a neuro-epithelial lining resembling developing ependyma.

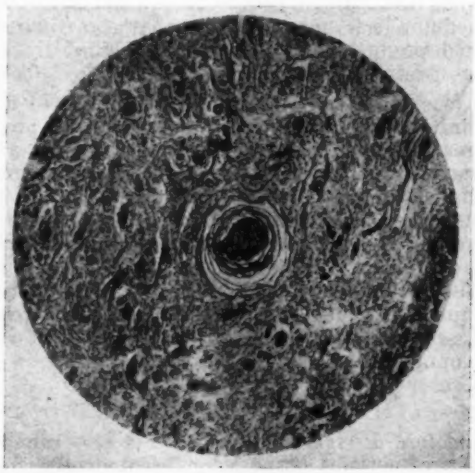


FIGURE X.
A Pacinian corpuscle in a retroperitoneal teratoma. Many small nerve bundles are seen in the neighbourhood. × 75.

At later stages still, in these masses of spongioblastic tissue, by using Cajal's gold sublimate method the differentiation of astrocytes can be traced.

Mature Central Nervous Tissue.—Mature central nervous tissue in teratomata most frequently takes

the form of large compact masses or smaller scattered patches of neuroglial tissue with or without ependyma-lined cavities. The neuroglial cells are predominantly astrocytes, and can be stained characteristically by Cajal's gold sublimate method. This method is most helpful in picking out small scattered patches of nervous tissue, which are selectively impregnated and precisely outlined amidst the surrounding unstained tissues. Rows or clumps of characteristic oligodendroglial cells are sometimes present.

The bulk of the mature central nervous tissue found in teratomata consists merely of neuroglial feltwork, and is devoid of nerve cells and nerve fibres. Occasionally, however, groups of well developed nerve cells are present.

The ependyma-lined cavities in the central nervous tissue vary from narrow canals to large rounded or irregular cavities filled with clear or slightly opalescent fluid. Many of the cysts in polycystic teratomata are of this nature, and in some instances one or more of these nervous cysts may form the bulk of the tumour. This applied to the sacral teratoma and to one of the retroperitoneal growths in the present series. Fringes of typical chorioid plexus are often present in parts of ependymal cavities, and secretory activity of this tissue is doubtless responsible, partly at least, for the accumulation of the watery fluid in the cavities. Not infrequently teratomata contain cavities lined partly by nervous tissue and partly by squamous stratified epithelium with abrupt transitions from one to the other. This rather remarkable relationship can be understood in the light of the early histogenesis of neuro-epithelium already described. Since neuro-epithelium develops from a plastic undifferentiated epithelium which also has the potency to form squamous stratified epithelium, it is not surprising that sometimes the finished product should be a cavity lined by both types of adult tissue.

Degenerative and senile changes, similar to those seen in the normal nervous system, are often present in teratomatous central nervous tissue. The commonest of these is the formation of rounded laminated calcified bodies or "brain sand". Less frequent is degeneration of areas of tissue, with the collection of macrophage foam cells and foreign body giant cells. In one of the mediastinal teratomata of this series parts of the central nervous tissue contain patchy deposits of melanin, possibly related to the melanosis of the brain which occurs as a rare developmental anomaly.

Peripheral Nervous Tissue.

Immature Peripheral Nervous Tissue.—Immature peripheral nervous tissue is represented occasionally in actively growing malignant teratomata by patches of tissue which structurally resembles that of developing sympathetic ganglia or of the neuroblastoma or sympathicoblastoma of young children. The patches consist of clumps of small round cells with darkly staining nuclei, arranged here and there in rosettes without central lumina. Rosettes may be few and ill defined, and recognition of the nature of the tissues is then difficult or impossible, just as it is in neuroblastomata in which rosette formation is poor.

Mature Peripheral Nervous Tissue.—Mature peripheral nervous tissue is frequently present in teratomata in the form of ganglia and nerves, and occasionally in the form of simple sensory end organs or corpuscles.

Nerve ganglia are to be found in many teratomata of the mature or benign type; they were present in eight of the eleven benign tumours of this series. Structurally they closely resemble normal sympathetic ganglia, consisting of abundant rounded and polyhedral nerve cells set in a meshwork composed of bundles of non-medullated nerve fibres.

Nerves also are often present in mature teratomata; they were found in eight of the eleven benign tumours in the present series. In most cases they clearly arise from ganglia, but occasionally they appear to have their origin from masses of central nervous tissue. Most of them consist of single bundles, small or large, in which sheath tissues often appear to be in excess and the non-medullated neuraxones relatively few. In the tumours of the present series no composite nerves made up of multiple fasciculi were found, and no medullated nerve fibres were seen.

Most of the peripheral nerves in teratomata appear to run indiscriminately and without obvious relationships to other tissues; but occasionally they take part with other tissues in the formation of an organoid structural complex. Thus in one of the retroperitoneal teratomata in this series one of the cysts is lined by a colon-like mucosa external to which are two distinct layers of smooth muscle; small nerve-bundles approach this muscular tunic from without and become continuous with an unmistakable Auerbach's plexus between the two layers of muscle.

Of sensory end-organs, in this series two examples have been seen, both Pacinian corpuscles found in two different tumours in areas rich in nerve bundles.

Conclusion.

In conclusion, a word may be said of the possible functional significance of some of the nervous elements in teratomata. The healthy appearance of many of the nerve cells in the ganglia, and less frequently in the central nervous tissue of teratomata, suggests that they may have been capable of functioning. It is therefore pertinent to ask whether the nerves in these tumours may not sometimes effect functional connexions with other tissues, and so influence their differentiation and growth in ways comparable to those obtaining in normal ontogeny. The first step in attempting to establish this view would be to demonstrate the presence of effector nerve endings in muscle fibres and glandular epithelia; and this has not yet been done.

Finally, it must be emphasized that the nervous tissues found in teratomata do not form an organized nervous system. The tissues are scattered and entirely unanatomical in topography, neurones are scanty or absent in much of the neuroglial patches, and tracts of nerve fibres are absent; ependymal cavities are irregular in distribution and shape, and are often disconnected and multiple; and peripheral nerve bundles are usually single, and never grouped

together to form large nerves. It is important to insist on these points, since many writers have claimed to see parts or whole of a brain or spinal cord in teratomata. Structures so frequently present as masses of central nervous tissue must necessarily assume, at times, shapes capable of fitting into almost any preconceived moulds.

Summary.

1. The frequent presence of neural components in teratomata is indicated, and their great variety is illustrated.

2. The possible functional value of some of the nervous elements is suggested.

Acknowledgement.

I am deeply indebted to Dr. C. A. Duncan, of the Alfred Hospital, for his willing and able help with the photomicrographs.

Bibliography.

H. R. Dew: "Malignant Disease of the Testicle", 1925.
R. A. Willis: "The Structure of Teratomata", *The Journal of Pathology and Bacteriology*, Volume XL, 1935, page 1.
M. Wilms: "*Die teratoiden Geschwülste des Hodens, mit Einschluss der sogennanten Cystoide und Enchondrome*", *Ziegler's Beiträge*, Volume XIX, 1896, page 233.

A PAPUAN FIELD EXPERIMENT OF MALARIA TREATMENT.

By F. W. CLEMENTS, M.B., B.S., D.P.H., D.T.M. (Sydney),
(*From the School of Public Health and Tropical Medicine, University of Sydney.*)

FOLLOWING the work of Professor Cuica and his co-workers in Roumania, there has developed a growing opinion amongst malariologists that the strain of malarial parasites may vary in different quarters of the globe, and further, that the actions of the anti-malarial drugs may also vary in their intensity upon these widely separated strains.

With the object of testing the actions of quinine and "Atebrin" upon the New Guinea parasites, a field experiment was conducted in the Mekeo District of Papua. Such experiments have been carried out frequently in other parts of the tropics, the reports of which are to be found in the literature, but very little work of this nature has been presented from the Austral Pacific Zone.

Method of Study.

For this experiment the Mekeo District of the Central Division of Papua was selected. Here the soil is very fertile, food is plentiful and of good quality, whereas malaria is hyperendemic. The soil tends to be more productive in certain areas than in others, and here the natives tend to congregate. The locality selected for this experiment was the central village of three which cover about two square miles of territory. The population in this area numbered about 1,200.

After camp and a temporary laboratory were established, all natives in the area who considered they were suffering from malaria were invited to present themselves for treatment. Out of a large number who visited the camp, sixty were selected as being possible sufferers from the malady, and of these thirty-seven were children and twenty-three adults.

Diagnosis of malaria was confirmed by clinical history, temperature, splenic enlargement and the presence of parasites in a thin blood film. It had been hoped that at least subtertian and benign tertian cases would be met with, but all positive films showed only the subtertian parasite (*Plasmodium falciparum*).

When treatment commenced, the natives were selected at random, and every alternate patient was given quinine. "Atebrin" was administered to the remainder. The drugs were administered by mouth, and were in tablet form, the dosage being according to age, as in Table I.

TABLE I.

Drug.	Age.		
	One to Five Years.	Six to Fourteen Years.	Over Fifteen Years.
	Gramme.	Gramme.	Gramme.
"Atebrin"	0·1	0·2	0·3
Quinine sulphate	0·6	0·9	1·2

Each day, at the same hour, the natives were lined up and a routine procedure was carried out. This included a recording of the temperature, splenic examination, preparation of blood film, and administration of drugs. This was all carried out under my personal supervision, and special attention was paid to insuring that the drug was definitely swallowed at the time of administration. Toxic effects were inquired for each day. This procedure was adopted for five days, and on the sixth records were made without the administration of drugs.

It is to be regretted that as this experiment was carried out during a general medical survey and the expedition had to move on shortly after the completion of the treatment, the relapse rate could not be studied. Further, it is doubtful if the relapse rate would be of any value, as the degree of reinfection would be high.

Results of Treatment.

As stated above, all cases were of the subtertian variety, and unfortunately all patients did not complete the week's treatment. Only fifty-one out of sixty remained to the end. Although I had hoped to have an equal number of natives under each type of treatment, no doubt owing to the unpleasant by-effects of the quinine, seven of those taking this drug failed to complete the week.

Action of Drugs on Fever.—As can be seen from Tables II and III, both drugs were effective in the reduction of temperature.

When the contents of Table II were examined by the chi-square test, it was found that the difference between the two results was not significant. Likewise, when the contents of Table III were examined

statistically, it was also found that the difference between the temperature gradients was also not significant. It was thus suggested that both drugs were equally effective in reducing temperature.

It will be noticed that in twelve cases the temperature had not fallen to normal even after five days' treatment. This is consistent with the universal behaviour of subtertian infections.

Action of Drugs on Splenic Enlargement.—The action of drugs on the size of the spleen is shown in Tables IV and V. As can be seen from these tables, quinine is slightly more effective in the reduction of

TABLE II.

Showing the Effect of Action of the Drugs on the Number and Percentage of Cases with a Temperature above 37·2° C. (99° F.).

Drug.	Number of Cases.	Number of Patients with Fever.									
		After One Day.		After Two Days.		After Three Days.		After Four Days.		After Five Days.	
		Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.
"Atebrin"	28	22	78·5	21	74·9	16	57·1	19	67·8	7	24·9
Quinine	23	19	82·6	17	73·8	14	60·8	11	47·8	5	21·7

TABLE III.

Showing the Effect of the Drugs on the Actual Temperature Gradients.

Figures shown are the means of all temperatures (in degrees Fahrenheit), together with the standard deviations.

Drug.	Before Treatment.		After One Day.		After Two Days.		After Three Days.		After Four Days.		After Five Days.	
	Temperature.	Standard Deviation.	Temperature.	Standard Deviation.	Temperature.	Standard Deviation.	Temperature.	Standard Deviation.	Temperature.	Standard Deviation.	Temperature.	Standard Deviation.
"Atebrin" ..	100·0	0·86	99·48	0·8	99·4	0·52	99·03	0·4	99·16	0·6	98·8	0·3
Quinine ..	99·76	0·8	99·63	1·28	99·4	1·2	99·27	0·8	98·95	0·48	98·8	0·4

TABLE IV.

Showing the Action of the Drugs on the Size of the Spleen. All Cases Treated.

Remedy Used.	Number of Persons with Enlarged Spleen.	Total Amount of Splenic Enlargement in Centimetres.	Average Amount of Splenic Enlargement Per Case in Centimetres.	Total Amount of Splenic Reduction in Centimetres.	Average Amount of Splenic Reduction Per Case in Centimetres.	Percentage of Splenic Reduction.
"Atebrin"	23	162	7·04	58	2·52	35·8
Quinine	19	112	5·33	40	2·1	39·3

TABLE V.

Showing Action of the Drugs on the Size of the Spleen. Children under Twelve Years of Age.

Remedy Used.	Number of Persons with Enlarged Spleen.	Total Amount of Splenic Enlargement in Centimetres.	Average Amount of Splenic Enlargement Per Case in Centimetres.	Total Amount of Splenic Reduction in Centimetres.	Average Amount of Splenic Reduction Per Case in Centimetres.	Percentage of Splenic Reduction.
"Atebrin"	14·0	91·0	6·5	31·0	2·2	34·0
Quinine	14·0	73·0	5·21	31·0	2·2	42·4

TABLE VI.

Showing the Effect of the Drugs on the Parasite Rate of Blood.

Drug.	Before Treatment.		After One Day.		After Two Days.		After Three Days.		After Four Days.		After Five Days.	
	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.
"Atebrin" ..	12	100·0	9	75·0	3	25·0	2	16·0	—	—	—	—
Quinine ..	17	100·0	16	94·0	6	35·0	4	23·0	—	—	—	—

the enlarged spleen. This is even more evident in children.

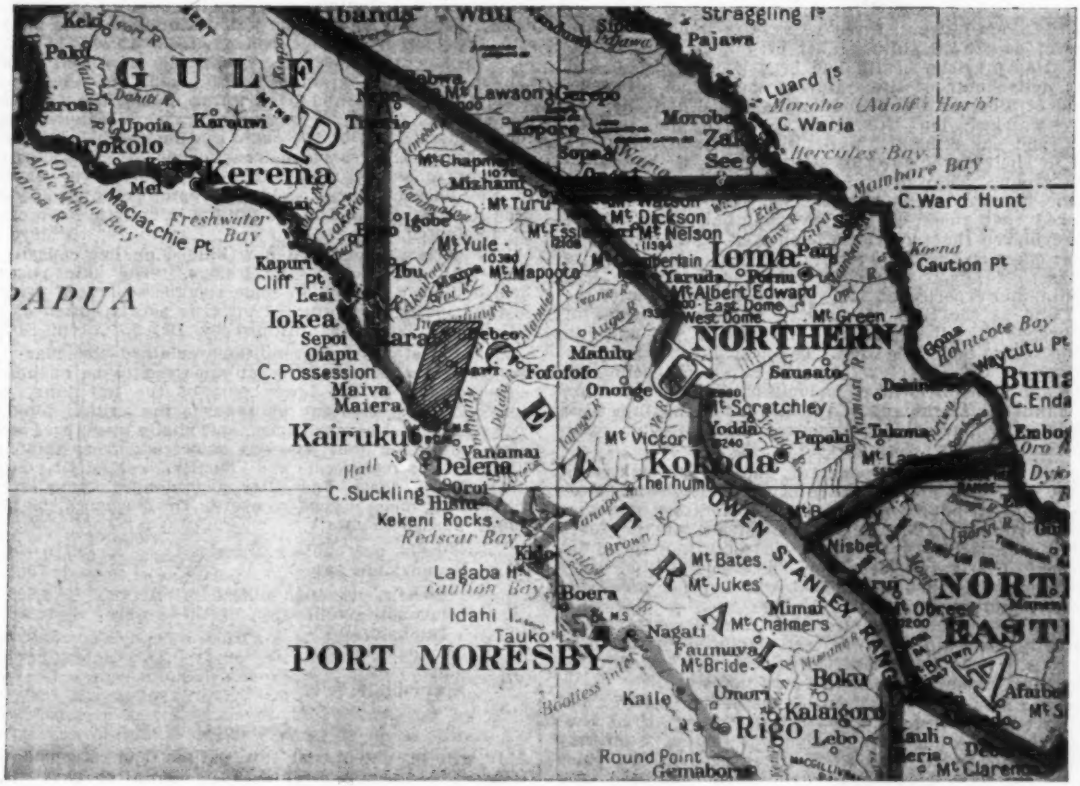
Action of Drugs on the Parasites.—The action of the drugs on the parasites was studied by examination of thin blood films. In order to establish a standard, one hundred fields were examined in every film.

It is noted that parasites were not found in every patient before the treatment was commenced, but it is the experience of workers in Papua and New Guinea that the parasites are extremely difficult to find in natives from a hyperendemic area.

The result of the action of the drugs on the parasites is set out in Table VI.

Discussion.

From this study it would appear that both drugs are equally effective for the treatment of attacks of malaria in a hyperendemic locality. "Atebrin" appears to be more acceptable to the natives because of the absence of tinnitus. Although no toxic effects were reported, it is hardly likely that none would appear in a larger group of cases, and as most of the routine administration of drugs in Papua is carried out by native medical assistants, the free distribution of "Atebrin" in these circumstances may lead to the exhibition of toxic effects.



The central portion of Papua. The hatched area in the Western Central Division depicts the Mekeo District, where this investigation was conducted.

It will be seen that both drugs remove parasites effectively after three days' treatment, and it would appear at a cursory glance that "Atebrin" is slightly more effective in this respect than quinine, but when the results are examined by the chi-square test, this difference is found to be not significant.

Toxicity of Drugs.—Inquiries were made each day for symptoms suggesting toxicity, and strangely enough the only complaints received were of tinnitus and deafness in the quinine series. No symptoms suggesting toxicity were reported from those natives taking "Atebrin".

Acknowledgements.

I wish to express my thanks to Sir Hubert Murray (Lieutenant-Governor of Papua) and to Dr. W. M. Strong (Chief Medical Officer) for permission to carry out this investigation; also to Messrs. Fassett and Johnson, of Sydney, for free supplies of "Atebrin".

Finally my thanks are due to Mr. K. J. Clinton, biochemist of the School of Public Health and Tropical Medicine, for valuable laboratory assistance in the examination of blood films.

Reports of Cases.

A CASE OF AGRANULOCYTOSIS, WITH RECOVERY.

By ALLAN S. WALKER, M.D., Ch.M.,

AND

R. A. GREEN, M.B., B.S.,

Sydney.

THE rarity of the fully developed agranulocytic syndrome, and the still greater rarity of cases in which recovery has taken place, warrant the publication of the following case.

Clinical History.

Mrs. I.L., aged twenty-three years, was under the care of one of us (R.A.G.) during her pregnancy and confinement. Her previous health had been good, and she had led an active outdoor life. During the second trimester a cloud of albumin was found in the urine, and she was closely watched, but this disappeared in the seventh month, and she remained well. Careful questioning has failed to elicit any history of taking drugs of the amidopyrine group. The only medication used by the patient was the regular taking of "Alophen" pills. It may be remarked that these contain phenolphthalein, but there is no evidence that so widely employed a drug has any sinister effect on the blood-forming tissues. Shortly before the onset of labour she contracted the then prevalent influenza, and experienced some pain in the left side of the chest, and at the time of delivery she showed signs of some bronchitis, but was afebrile. The labour was uneventful, one suture being required. The next day her temperature rose to 38·9° C. (102° F.), the pulse rate being 110 to 120, and signs of lobar pneumonia on the left side were now manifest. At the end of the first week two injections of "Edwenil", four cubic centimetres and two cubic centimetres respectively, were given.

Fever of a hectic type persisted, and on the eighteenth day the degree of non-resonance of the central and lower part of the left lung was such that exploratory puncture was carried out. Though the persistence of the fever strongly suggested an empyema, no fluid was found on needling. The pelvic condition had remained perfectly satisfactory throughout; uterine involution had proceeded perfectly, and at no time had there been a suggestion of any puerperal complication. The patient was excellently nursed in a very well equipped private hospital, but it was felt when the illness had lasted three weeks that further investigation was necessary.

She was seen in consultation by one of us (A.S.W.) and transferred to his care in the Royal Prince Alfred Hospital. Her condition at this stage was that of a severely but not critically ill person. She was pale, in fact paler than might have been expected, a little distressed, and signs suggesting consolidation of the lower lobe of the left lung were still present. It was thought that she had an encapsuled collection of pus, possibly an interlobar empyema. Her temperature on admission was 38·9° C. (102° F.); the pulse rate was now 140. Examination of the blood revealed 2,670,000 red cells per cubic millimetre, with some variations in size and shape of the cells, and some stippling; the hæmoglobin value was 45%, giving a colour index of 0·89. The white cells numbered only 1,300 per cubic millimetre, of which 88% were lymphocytes, 8% neutrophile cells and 4% basophile cells. It was thought that the anæmia might possibly be puerperal, in part at least, but the alarming leucocyte count pointed to a diagnosis of angranulocytosis. Pentnucleotide treatment was at once begun, in doses of ten cubic centimetres injected intramuscularly twice a day. At this stage there was a dramatic change in the patient's condition. She looked desperately ill, the temperature rose to 40·2° C. (104° F.), the pulse rate was never below 150 per minute, though the respiration rate was seldom above 35. She complained of a sore mouth, and white patches appeared on the palate; a hard tender lump appeared in the left breast, and pustules appeared all over the skin of the back. She rapidly became worse, her mental condition was wandering and irresponsible, and on the fifth day after admission to hospital she appeared almost moribund. At this stage her condition began to improve; the temperature and pulse rate fell, resuming their previous remittent type of pyrexia, and she began to cough up moderate quantities of foul sputum. The mass in the breast increased in size and felt softer. It is interesting to remark that the leucocyte count which had fallen to 1,000 per cubic millimetre, and then to 900, showed a steady loss of granular cells; in the last-named total all the cells were lymphocytes. On the seventh day after the patient's admission to hospital the leucocyte count rose to 3,500, 73% being neutrophile cells; the temperature had now fallen, but the patient still looked desperately ill. Improvement in the blood state thus preceded definite clinical improvement, a finding noted by others who have reported cases. In a day or two she was out of immediate danger, and the leucocyte count had risen to 13,700, of which 81% were neutrophile cells. These cells were well formed, though basophilic granules were noted, and there were some young forms and band forms seen. The treatment during the period of greatest urgency included pentnucleotide, a total of 150 cubic centimetres being injected in eight days, three blood transfusions each of 600 cubic centimetres, and "Campolon", 20 cubic centimetres. Culture of the buccal lesions yielded streptococci and a yeast, *Monilia albicans*; and in the sputum hæmolytic streptococci predominated.

The patient's condition now hinged on her capacity to deal with her focal septic lesions. The skin pustules healed readily, though in some sloughs separated prior to healing. The local area of mastitis slowly softened, and two weeks later was drained by Dr. J. Colvin Storey.

Meanwhile the chest condition remained stationary. X ray examination showed what appeared to be pneumonic consolidation in the lower part of the left lung, with some effusion extending up towards the axilla. Needling was carried out several times, and finally over three weeks after admission foul pus was aspirated; from this grew hæmolytic streptococci and *Bacillus coli*. Dr. Storey drained the chest, and after a prolonged convalescence the patient made a good recovery. On discharge the blood count was as follows:

Red cells, per cubic millimetre	4,120,000
Hæmoglobin value	75%
White cells, per cubic millimetre	8,600
Neutrophile cells (3% of these were band forms)	46%
Lymphocytes	44%
Monocytes	1%
Eosinophile cells	9%

Comment.

It will be noted that this patient had a considerable degree of anæmia. This is no essential part of the agranulocytic syndrome, but in this case it is not known whether she has suffered from an iron deficiency associated with or independent of pregnancy. It may be assumed that the complete disappearance of the granular leucocytes from the circulating blood allowed a bacteriæmia to occur, hence the skin pustulation and the combined streptococcal and bacillary infection of the lung. One unusual point is the finding of 9% eosinophile cells after recovery; the appearance of eosinophile cells in the circulating blood has often been remarked to be considerably delayed, sometimes for months.

What was the cause of this illness? Amidopyrine or other similar drug may be ruled out. The patient may be one whose bone marrow has little reserve; the condition of the red cells suggests some hæmopoietic defect. The association with pregnancy and labour may also be significant. Did the superadding of a pneumonic infection turn the scale and add to the burden on the bone marrow? More interesting still it is to speculate why she recovered. As has been noted in other such cases, the clinical improve-

ment of the patient coincided with the occurrence of suppurative lesions. Some writers have argued that such complications have stimulated the production of granulocytes, or at least the flow of these cells from the marrow (where they are usually abundantly present in an undeveloped state) into the blood stream. But it is hard to reconcile a view which on the one hand blames the presence of infection for depression of the bone marrow and on the other hand adduces it as a reason for recovery. Even if it is held that in this case the pneumonia had no part in causing the agranulocytosis, why should the occurrence of abscesses in the lung and the breast help towards recovery when for weeks past an equally potent bacterial stimulus has been present in the patient's body?

This history of this patient resembles that of others who have recovered. Whatever be the influence that cuts off the supply of granulocytes so dramatically, or that which reestablishes that supply once more, the period elapsing between these events is one of dire peril and demands the most energetic treatment.

Acknowledgements.

We are indebted to Dr. J. Colvin Storey for his surgical care of this patient, to Dr. Edgar Thomson who carried out the blood transfusions, and to Dr. D. R. Reid for the case history notes and for his unremitting attention.

Reviews.

PSYCHOANALYTICAL LETTERS.

IN the "Book of the It", Georg Groddeck has given an unconventional background for his psychological views.[1] Abstracted from the material used at his weekly discussion meetings, the material has been written in a series of letters to a woman under the pen title of Patrik Troll. His experiences are both artless and intimate. To use his own expression, he babbles on without end, but this is in keeping with his theory of the It, as an unconscious always in a state of eruption.

> I hold the view that man is animated by the Unknown, that there is within him an "Es", an "It", some wondrous force which directs both what he himself does, and what happens to him. The affirmation "I live" is only conditionally correct; it expresses only a small and superficial part of the fundamental principle "Man is lived by the It".

Based on the slender evidence of the habit of playing with his watch chain, there is an autobiographical confession of a masturbation complex. This is the method employed throughout the book, a case history, a reminiscence, a trivial incident all followed up by free association to conclusions which may be so absurd as to make the reader wonder if the whimsical Groddeck is entirely serious. His candour is disarming: "If I could get clear about the It, I should think I was no less than God."

His sense of humour may be sensed from the following brief quotation from a letter on sex and the castration complex.

> Would you like to know still more about animals? Good. Station yourself for a few hours in front of the monkey cage at the Zoo, and watch the children: you may even spare some of your glances for the grown-ups. If in those few hours you have not learned more of men's souls than you will find in hundreds of books, then your eyes are not worth carrying in your head.

The author pays wholehearted tribute to the influence of Freud, and describes his own conversion from the authoritarian suggestion school of Schweninger to that of free association. In his own words his relationship is as follows:

> My treatment, in so far as it is different from what it used to be, consists of the attempt to make conscious the unconscious complexes of the "It", to do this systematically and with all the cunning and all the strength at my command. That is certainly something new, but it originated not with me, but with Freud; all that I have done in the matter is to apply this method to organic diseases. Because I hold the view that the object of all medical treatment is the It; because I hold the view that this It, with its own masterly power, forms the nose, inflames the lungs, makes a man nervous, prescribes his breathing, his gait, his activities.

It is, however, apparent that in practice he uses both. That the underlying motives of the It are chiefly sexual is apparent, and sex is written large on every page. Whilst every psychiatrist could cite parallel cases, it is highly probable that Groddeck's undoubted brilliance has led him to a biased end point, partly on account of his own psychological difficulties as demonstrated in these series of letters and partly on account of his type of patient.

The book will be read with interest by those who have a flair for psychology and whose knowledge allows them to sift the wheat from the chaff. In the hands of the general public, the reading of such a work can but fan the flame of an eroticism, which is already over-stressed. That sex is important is beyond question, but were it true that it was everything, there would still be need for a measure of repression. The limits of freedom may be easily carried to excess.

The niche which Groddeck will fill in history will concern his insistence on the psychological approach to organic disease. Even if his version of the ætiology be questioned, his vital principle of an important relationship still remains. The book suffers from two irritating drawbacks which should be remedied in a subsequent edition: there are neither chapter headings nor index.

[1] "The Book of the It: Psychoanalytic Letters to a Friend", by G. Groddeck, M.D.; 1935. London: The C. W. Daniel Company. Crown 8vo, pp. 301. Price: 10s. 6d. net.

THE SINGLE WOMAN.

IN the course of her evolution towards the third sex, which Anatole France foretold in the Utopian section of "*Sur La Pierre Blanche*", the single woman has a hard road to travel. In her book, "The Single Woman and Her Emotional Problems", Dr. Laura Hutton deals very sympathetically and skilfully with some of the difficulties of the modern independent woman.[1] Her chapter on unequal friendships, the adoration of the emotionally infantile type for the woman older in her adjustment to life, if not in years, sets out the many dangers and pitfalls of such a relationship.

The irritating baby-talk, the over-anxiety about trivial physical comforts, the exactions and the jealousy that are so distressing and embarrassing to an onlooker, are given their true explanation as psychopathological phenomena, and their recognition should help the victims to control these unfortunate manifestations. The necessity for an "adult" type of friendship, with mutual freedom, tolerance and understanding—"respect for the friend's personality"—are shown to be a fundamental necessity in any satisfying relationship.

Of course the author recognizes that merely to read a book, even as authoritive as her own, will not cure abnormal impulses. The sources lie deeper than the conscious mind, and to say to a woman, "You must sublimate this", without a deep analysis of the origins of the psychosis, is, she admits, futile.

Although woman has accomplished much by way of sublimation in the arts, science and literature, the way is never easy for her. Belonging as she does, according to Schopenhaeur, to the World of the Will, it is doubtful if

[1] "The Single Woman and Her Emotional Problems", by L. Hutton, B.A., M.R.C.S., L.R.C.P., with a foreword by D. Forsyth, M.D., D.Sc., F.R.C.P.; 1935. London: Baillière, Tindall and Cox. Foolscap 8vo, pp. 161. Price: 5s. net.

she can ever really inhabit the World of the Idea. Her normal emotional impulses can be satisfied only by a mate and children; and although Dr. Hutton touches the subject of sexual substitutes and inversions with courage and understanding, it seems clear that any course at variance with her biological needs must cause conflict even in the most emancipated of women. As a guide to physicians and educationists, and as an inducement to sufferers to seek skilled psychiatric investigation, this book should take an important place among modern psychological treatises.

EPIDEMIOLOGY.

EPIDEMIOLOGY has in these days become a front-line science. Our ancient forefathers regarded an epidemic of disease as a visitation, a divine retribution, a penalty for national or individual sinning. With the discovery of the germ as the cause of many diseases much of the mystery was removed and scientific interest became centred on these invading organisms. Now more attention is being bestowed on the human host and his response to attack, and detailed knowledge on the subject is fast accumulating. Outbursts of infectious diseases are governed not by chance, but by the operation of definite laws, and one of the most interesting problems of modern medical research is to discover and formulate these basic laws.

Professor Major Greenwood's book on "Epidemics and Crowd-Diseases" provides a useful introduction to the study of these intricate problems.[1] The book is based on lectures given to students at the London School of Hygiene and Tropical Medicine, and is dedicated "affectionately" to the "Tea Club of the Division of Epidemiology and Vital Statistics in the School".

Professor Greenwood has adopted the historical method of presentation, and the first portion of the book is a general review of the subject. Ages ago Hippocrates distinguished between endemic and epidemic diseases and tried to solve the two great problems: (i) what are the factors of local endemicity, and (ii) what are the reasons of epidemic prevalence? The search for the solution of these problems has continued into our own times. Progress has been slow, and Greenwood says that even the work of the great Sydenham did little to advance the knowledge of epidemiology beyond its status in the days of Hippocrates.

John Graunt, the son of a London draper, and himself for many years a prosperous city shopkeeper, is described by Greenwood as one of the great men of science, and his work in founding the study of vital statistics is eulogized. The first book ever published on vital statistics, "The Natural and Political Observations upon the Bills of Mortality", was written by John Graunt.

William Farr is another of the great ones whose work is reviewed. "Farr found medical statistics in such a state that only men of genius, like Graunt, could use them at all without reaching false conclusions, and when he retired from the public service he left them so organized and arranged that any reasonably intelligent man could draw accurate conclusions from them."

The most interesting chapter in the book is Greenwood's discussion on experimental epidemiology. He describes the work conducted by Topley and himself in the London school into diseases occurring among colonies of mice. Many difficulties confront the student of epidemics in the human crowd. "Epidemics behave so wilfully. The population will not stay put; all kinds of disturbing and, as we think, irrelevant factors destroy the simplicity and symmetry of the phenomenon. How much better it would be if we could mould a little epidemiological world of our own nearer to the heart's desire. That is the art of the experimental epidemiologist. He brings into existence a little world of his own, introduces into that world some sickness, and watches what happens." Even so, the way to truth is not easy, and Topley himself, in a recent address on this work, has stressed how difficult it is to apply the observations made on diseases of mice in cages to the practical problems of diseases in the human species.

The second portion of the book provides detailed reviews of the various epidemic diseases. The typhoid group, typhus, measles, scarlet fever, smallpox, plague, diphtheria and the rest are discussed in turn, and the methods of active immunization against some of these diseases are given full attention.

Concerning venereal diseases, Greenwood states that, although sufficient scientific knowledge exists to enable control to be brought about, the moral stigma still existing in most civilized countries hinders satisfactory progress. Yet there is "this ground for optimism: that on the whole the crowd attitude, as expressed in its administrative rules and its social reactions, is a little saner than before the war. But this generation will have passed away, and many billions of words will have been spoken before the most eminently preventible of all crowd-sicknesses are actually prevented."

Nor is he very hopeful about the elimination of tuberculosis. In the early fifties of the nineteenth century a decline in tuberculosis mortality began. Apart from its temporary interruption by the World War this progress has continued. Various explanations of this gradual improvement have been put forward. The great advancement in scientific knowledge has played its part, and the effects of good housing and proper feeding have been significant. Yet "it is idle to speak of the conquest of tuberculosis; tuberculosis has not been and, so far as one can see, never will be conquered. We may, however, reasonably expect a further decline of mortality, provided that our means allow us to improve the general environmental conditions of the people."

Dr. Greenwood's book will interest not only professional students of public health, but also a wide circle of general readers. It is a book "full of meat", and its readers should come prepared to devote ample time to the meal.

Infectious diseases and their manner of spread are best studied as biological problems in the wide sense, and medical progress—the elimination of disease—depends on our ability to discover and utilize this knowledge of the biology of parasitism. As an outline of past achievement Greenwood's book is a healthy stimulus to further endeavour.

[1] "Epidemics and Crowd-Diseases: An Introduction to the Study of Epidemiology", by Major Greenwood, D.Sc., F.R.C.P., F.R.S.; 1935. London: Williams and Norgate, Limited. Demy 8vo, pp. 409. Price: 21s. net.

Notes on Books, Current Journals and New Appliances.

LETTERS FROM ITALY.

IN the form of letters written from Rome between November 1 and December 7 of 1935, Dr. H. M. Moran has published a booklet expressing his views on the Italo-Abyssinian conflict.[1] He understands and values highly the Italian temperament and outlook, and deprecates the misunderstanding patent in the British attitude to Italy's efforts for expansion. The League of Nations is censured for its inconsistency and for its failure to appreciate the lasting bitterness and world-wide disruption which, it is held, the imposition of sanctions must entail. The letters contain reflections on the subversive doctrines of the Soviet, whose adherents multiply when national unity is threatened; on the isolation of Australia, for the most part an ignorant prey to propaganda; and on the base foolishness of arousing resentment and hostility in a former ally. Dr. Moran concludes with a tribute to the fortitude and self-sacrifice of the Italian people.

[1] "Letters from Rome: An Australian's View of the Italo-Abyssinian Question", by H. M. Moran, M.B., Ch.M., F.R.C.S., F.A.C.S.; 1935. Australia: Angus and Robertson Limited. Demy 8vo, pp. 54. Price: 1s. net.

The Medical Journal of Australia

SATURDAY, FEBRUARY 15, 1936.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE RIGHTS OF THE PATIENT.

WHEN the medical undergraduate has spent two or three years in the study of the preliminary sciences—biology, chemistry and physics—and has satisfied his examiners in anatomy and physiology, he passes on to hospital wards where he comes into contact for the first time with men and women stricken by disease. The full significance of his first contact with suffering humanity does not always dawn upon him. He has to study disease from the academic point of view—he has to learn how it arises, he must become familiar with the macroscopic and microscopic changes that take place in the body when disease has become established, and he learns from the words of his teachers and from clinical experience how repair and recovery take place. He may at first be liable to look on the sick man or woman merely as a case, an example of this or that pathological process; but as a rule his teachers disabuse his mind of such ideas and he is taught to regard the sick person as a human being. He understands that the sufferers are beings of like passions, feelings and sympathies with himself, that they have had to leave for a time their usual avocations and that they want to recover their former health so that they may return to their usual mode of living. By the time he graduates the student realizes, or should realize, that in medical practice of every form the patient—his recovery, his general welfare and the preservation of his health—must remain the first and only consideration.

The rights of the patient are curiously regarded by some medical practitioners; by their attitude they would appear to have forgotten the lessons learned in their undergraduate days; they would cede a right with one hand and take it away with the other. Every medical practitioner will assent in the proposition that a patient has the right to choose his own medical attendant. In some forms of public hospital practice the exigencies of administration make it impossible to allow a patient to exercise his choice; but it must be recognized that whenever possible the rights of the patient in this matter should be unfettered. As a rule they can be. It is fitting that the principle of free choice of medical attendant should be emphasized at the present time when governments and other bodies are having national insurance and schemes for State medical services brought to their notice. In a democratic country, such as Australia, any other principle would be unacceptable. The members of the medical profession are insistent on the observance of this principle in friendly society practice and in workers' compensation cases. The alleged deflection of patients from their private medical attendants in workers' compensation cases is a never-ending cause for complaint at Branch council meetings; it is a fruitful cause for indignation at meetings of general practitioners. Very often the complaints are justified, and in some Branches rules have been introduced in an attempt to mitigate the evil. The matter is so important that every effort should be made to enforce rules of this kind.

There is another side to the question. If a patient is to have free choice of his medical attendant, he should be allowed to change his

attendant or to seek additional advice without causing resentment. Patients have divers reasons for seeking additional advice. Many are ignorant of the correct procedure and their acts call for understanding and tact. The situation need not be laboured. Certain practitioners see in a patient's vagaries a personal affront and refuse to have anything further to do with the patient either in the illness in which the so-called affront occurred or in any subsequent illness. This attitude is often adopted; it is not only foolish, it is wrong. Patients should have the free choice of their medical attendants, and medical practitioners have no proprietary rights over patients.

Current Comment.

CHRYSOTHERAPY AND PUNCTATE BASOPHILIA.

THE exact significance of stippling of the red cells, or punctate basophilia, is not yet understood. As basophile granules occur in bone marrow and the blood of new-born infants, they have been considered to indicate blood regeneration. Gulland and Goodall do not agree with this suggestion. They consider the stippling to resemble the degenerative granules seen in the red cells after poisoning by phenylhydrazine. While the cells containing the granules are probably young forms, the stippling should be considered as an indication of pathological change and not of mere youth. It was found that granular red cells were more numerous, the greater the severity of toxic manifestations. Hence Gulland and Goodall regarded them as the expression of degenerative changes. Punctate basophilia occurs in pernicious anæmia, the leuchæmias, the anæmias associated with neoplasms and malaria. In plumbism this condition is very pronounced. At one time a theory was advanced that the turpentine used as a vehicle for lead paints actually caused the punctate basophilia, but this suggestion is not now maintained. Syphilitic patients treated by bismuth injections do not exhibit the phenomenon.

Gold has come much into use in the treatment of tuberculous and "rheumatic" or rheumatoid disorders. G. J. Griffiths and J. Race, examining blood films from a patient suffering from myelogenous leuchæmia with "rheumatic" symptoms, found punctate basophilia and polychromatic cells. This patient had received injections of gold. Griffiths and Race thereupon examined other "rheumatic" or rheumatoid patients treated by gold and found punctate basophilia and polychromatic cells in all.[1] No other primitive red cells were found. In determining the time of onset of such phenomena it was found that, of five patients receiving two injections each at weekly intervals, four showed the changes, and of a similar number receiving three injections at similar intervals, four again had polychromasia and punctate basophilia. It was thus ascertained that these primitive cells might appear after a second, if not a first, injection of gold. The length of time during which these cells persisted after the last injection was also ascertained and it was found that they might still be present ten months later; but none extended to twelve months. The gold preparations used were "Sanocrysin" and "Myocrysin". All those treated by "Myocrysin" showed polychromasia and punctate basophilia. Of those receiving "Sanocrysin", only one showed abnormal cells. The dosage given did not seem to influence the appearance of primitive cells, which were observed after two injections totalling 0·15 gramme of "Myocrysin". It is mentioned that E. Gaul and A. H. Staud found gold spectroscopically in the cutis after the administration of 0·1 gramme of gold.

Little deviation from the normal was found in the total red cell count and the hæmoglobin percentage after one or two injections, except a slight reduction in the total red cells, which soon returned to normal. In all there was a leucopenia, the average white cell count being from four to five thousand per cubic millimetre. The polymorphonuclear cells were decreased with a relative increase of the lymphocytes. The average number of punctate basophile cells per hundred white cells counted was three to four, but in one case two counts at an interval of four days gave a total of thirty-one. This patient had received three injections of "Myocrysin", totalling 0·11 gramme. The more important blood changes noted by other observers in patients under chrysotherapy are: increase in coagulation and bleeding time; leucopenia with relative lymphocytosis; eosinophilia and thrombopenia with reduction of platelets down to 22,000 per cubic millimetre. In the cases recorded by Griffiths and Race there was no obvious diminution of the platelets and no importance was attached to the leucopenia and relative lymphocytosis, as such a condition occurs in chronic rheumatoid arthritis when gold is not exhibited. The highest eosinophile percentage noted by Griffiths and Race was eight—a value often occurring in rheumatoid arthritis not treated by gold. Both lead and gold produce a temporary anæmia. Punctate basophilia and polychromasia appear in the blood after minute doses, even following a first or second injection. But in both there is a tendency to revert to normal on cessation of treatment. J. Bousser and P. Well state that gold induces a specific intoxication in the blood or on the bacteria circulating in the blood, and the altered blood causes a change in the elements composing it. It has been suggested that some people have an idiosyncrasy to gold, but the findings of Griffiths and Race do not support such a contention. They consider that both lead and

[1] *The Lancet*, September 28, 1935.

gold cause a local concentration of the basophilic substance, which is normally distributed evenly. Thus is produced the punctate basophilia and polychromasia found also in immature cells. They further suggest that the changes caused by these heavy metals are probably reversionary and due to toxic degeneration. It must be said that the precise explanation of these phenomena has not yet been elucidated. A practical point in gold therapy is obvious, namely, that it is safer to use small doses at long intervals. Gold is also known to induce albuminuria—another reason for caution.

EPIDEMIC DROPSY.

EPIDEMIC dropsy is usually placed among the so-called deficiency diseases. It has been regarded by some as a form of beri-beri and has been confused with beri-beri by others. It is now recognized by authorities as a disease *sui generis*; but its cause is still obscure. Its chief characteristics are œdema, fever, exanthem, breathlessness, and dimness of vision. It often attacks several members of a family, sometimes every member. Pregnant women suffering from it almost invariably abort. As far as is known it occurs only in communities where rice is the main article of diet. Outbreaks in India in 1934 and 1935 have provided material for further study of this interesting disease, and a number of investigators have taken advantage of the opportunities presented. A series of articles on the symptomatology and pathology appear in a recent issue of *The Indian Medical Gazette*. In the first paper R. N. Chopra and R. N. Chaudhuri give a report of an outbreak of the disease in Purulia.[1] In this epidemic, as in previous ones, the incidence was highest among people of the upper and middle classes. Chopra and Chaudhuri found that the disease was "practically non-existent among the poor labouring classes". Servants who had their meals in their masters' houses were sometimes affected; but they did not transmit the disease to members of their own families. No milled rice is used in the villages round Purulia. The more affluent people prepare rice from paddy at the end of the harvest and store it in their houses; the labouring people are paid for their services in paddy, day by day, and husk it into rice for immediate use. There are other differences in the methods of preparing rice for consumption; for example: the well-to-do eat their rice with mustard oil, vegetables, *dâl et cetera*, while the poor people seldom have more than salt and chillies with theirs. Children under four years of age did not contract the disease, presumably because they ate very little rice. Chopra and Chaudhuri found rice from affected houses to be infected with organisms of the *vulgatus* group; but they do not mention any bacteriological investigations of rice in other quarters. Some strains of the organisms that they isolated were agglutinated by sera of convalescent patients at quite a high titre. They mention the possibility of preparing an antiserum.

In the second paper, E. O'G. Kirwan discusses the ocular complications of epidemic dropsy.[1] The main ocular complication is glaucoma of the primary non-inflammatory type; it occurs quite early in the course of the illness and is nearly always bilateral. It was formerly thought that raised intraocular tension was a late manifestation; but in the Indian outbreaks in recent years it was frequently observed when other signs were slight or absent altogether. Thus, in some cases, "the toxins showed a special predilection for the intraocular capillary endothelium, while, in the majority . . . this endothelium was involved with the general endothelial system of the body". A substance resembling histamine was found in the aqueous humour of persons affected with glaucoma, but not in the eyes of normal controls. As there is no evidence of damage to the cells of the ciliary body, Kirwan believes that this substance is a toxin produced by specific microorganisms in the alimentary tract. Treatment consists in the elimination of rice from the diet and, if necessary, operation. Kirwan states that purgatives have scarcely any effect in lowering the intraocular tension, and miotics are useless. He suggests that if the organism and its toxin responsible for epidemic dropsy are discovered, a considerable advance will be made in the elucidation of the glaucoma problem. The progress of research in epidemic dropsy in India might be followed with advantage by ophthalmologists throughout the world.

The pathology of epidemic dropsy is discussed by M. N. De and K. D. Chatterjee.[1] Perhaps their most interesting finding was the absence of disease of the spinal cord and peripheral nerves. In beriberi degenerative nervous lesions invariably occur.

In the fourth paper, R. N. Chopra and R. N. Chaudhuri describe the clinical appearances and histopathology of the various cutaneous manifestations of the disease.[1] The lesions consist of an erythematous rash, pigmentation, petechiæ and sarcoids.

As a result of these latest investigations there can no longer be any doubt that beri-beri and epidemic dropsy are distinct. In the Purulia epidemic there was no evidence of vitamin *B* deficiency; furthermore, the people who had the poorest diet were the least liable to the disease. Epidemic dropsy can no longer be classified as a deficiency disease. The evidence as to ætiology is strongly in favour of an infection of the alimentary tract. The nature of that infection remains to be discovered. During the past few years various observers have expressed doubts concerning the accepted ætiology of other of the so-called vitamin deficiency diseases. It seems likely that something more than mere lack of vitamins may be necessary for their causation.

[1] *The Indian Medical Gazette*, September, 1935.

[1] *The Indian Medical Gazette*, September, 1935.

Abstracts from Current Medical Literature.

PÆDIATRICS.

Empyema.

R. B. BETTMAN (*Archives of Pediatrics*, September, 1935) discusses the treatment of empyema. He considers that the confusion and dissatisfaction existing in regard to treatment are due to lack of appreciation of three fundamental points: (i) Intrapleural accumulations of fluid are not harmful *per se*. In the majority of cases they are actually beneficial in separating the pleural layers and preventing most of the pain in pneumonia, and in permitting a certain decrease in tension and partial immobilization of the lung. Fluid is harmful in only two instances, namely, when it has reached such proportions as to cause either cardiac or respiratory embarrassment and when it is so toxic that its absorption causes the hectic fever and the malaise and cachexia of empyema. (ii) The dictum that "pus should be evacuated" applies to infection in the pleura as it does to infection elsewhere in the body. The author considers that the multiple aspiration method of Bremerman fails because the aspirating needle is too small to rid the pleura of its infectious contents, and the interval between aspirations is too long to keep the pleural space free of pus. On the other hand, the time-honoured method of rib resection with open drainage must go by the board, because of its primary shock and because it provides for no means of expansion of the lung. For these reasons he is of opinion that the easiest way of establishing a fairly thorough and continuous drainage is by the so-called closed method of treatment of empyema, described at length in numerous other places. (iii) The third and most important principle of treatment is that the drainage tube should never be removed until the empyema cavity has completely closed, because an empyema can be said to be cured only when the cavity is obliterated. The author recommends that the drainage tube should be retained until not more than one cubic centimetre of Dakin's solution (used for irrigating the cavity) can be introduced into the tube without the fluid's either ejecting the tube or squirting back around it.

Epidemiology of Acute Poliomyelitis.

HJALMAR WENNERBERG (*The British Journal of Children's Diseases*, July-September, 1935) has made a study of the epidemiology of poliomyelitis. He first of all discusses the two hypotheses which at present contend for the foremost place in medical opinion in regard to the dissemination of the disease. The contact theory, first propounded by Wickman, and until the last few years generally accepted, assumes that the disease is disseminated through the transfer of the virus from one person to another through droplet infection from the naso-pharynx. The author points out that it is characteristic of this disease that its dissemination is altogether independent of the density of the population and of channels of communication, and that even most intimate contact with the patient seems to entail no risk. Attention is also drawn to the comparative rarity of cases in schools and other institutions for children, which otherwise offer the most favourable conditions for contact infection. The author also produces argument against the assumption by supporters of this theory that immunization may take place through abortive forms of the disease and partly through so-called latent infection. The water theory of Kling assumes that the intestine is the point of entrance of the virus and that infection is disseminated, as in other intestinal infections, through food, especially drinking water. In the author's opinion this theory stands on a much higher level than the contact theory, but he gives reasons why it cannot be accepted. He then ventures to assert, "with a degree of certainty that is rarely attained", that the virus of poliomyelitis cannot enter through the respiratory tract or through the intestine. This being so, there remains nothing but inoculation through the skin—a process which in nature is effected only by insects. The author has for a number of years held the conviction that insects are responsible for the dissemination of the disease. This conviction was strengthened when, at the beginning of the latest epidemic in Gothenburg in September, 1934, insects were noticeably numerous in all parts of the town. Since it was clearer than ever that neither contact nor food played any part in the dissemination, it appeared more and more likely that one of these insects must be carrying the virus. The question as to what insect is concerned can be answered only by guesswork at the present time, but the author is inclined to suspect some species of mosquito.

Antirhachitic Factor in Human Milk.

I. A. SABRI AND M. M. FIKRI (*Archives of Disease in Childhood*, October, 1935) record their investigations in a further study of the antirhachitic factor in human milk. Shawki's statistics published in 1928 show that 50% of Egyptian children between the ages of six months and two years have definite clinical manifestations of rickets. Such a high incidence is surprising in a country noted for its clear sky and abundant sunlight. As a result of their experiments in 1932 the authors came to the conclusion that the milks most commonly used for infant feeding in Egypt (human, cow and buffalo) did not contain fully formed vitamin *D* in amounts of any practical value in the prevention of rickets. They found, however, that these milks contained sufficient amounts of provitamin *D*, which, after activation by exposure to ultra-violet rays, endows these milks with definite antirhachitic powers. In 1933 Sabri was able to demonstrate that the amount of ultra-violet radiation in the sunlight of Egypt in winter and spring was far below that expected from the amount of sunshine. The excessive heat of the summer, on the other hand, interferes with any sufficient exposure of children to the summer sunlight, in which ultra-violet rays are abundant. The author's recent investigations with more available material have given results similar to those previously obtained by them. They conclude that rhachitic Egyptian infants, in addition to a deficient supply of ultra-violet rays, receive insufficient amounts of provitamin *D* in their milk supply.

Acute Appendicitis in Infancy.

ROY M. GREENTHALL (*Archives of Pediatrics*, September, 1935) mentions the rarity of acute appendicitis in infancy and the difficulty in diagnosis, which is often not made until perforation and peritonitis occur. He draws attention to certain cases which have been reported with bloody stools as one of the clinical manifestations and gives a report of such a condition. Although this manifestation is rare, it should be given consideration in the diagnosis. The occurrence of this misleading sign may be fortunate for the patient, as intussusception is diagnosed and operation undertaken early and the appendix removed before perforation occurs. The chief error to be avoided is the diagnosis of gastro-enteritis in an infant with vomiting and a small amount of blood in the stools.

ORTHOPÆDIC SURGERY.

Radical Operative Treatment of Bone and Joint Tuberculosis.

P. ERLACHER (*The Journal of Bone and Joint Surgery*, July, 1935) discusses the indications for the radical treatment of bone and joint tuberculosis. (The article has been translated from the German by W. P. Blount.) He considers that this condition is a metastasis and not a primary disease of the bone or joint, and also emphasizes the extremely long time which may elapse between the secondary implantation and the appearance of symptoms from the metastasis. A necessary preliminary for determination of the form of treatment implies an exact diagnosis of the location and extent of involvement to which modern X ray technique materially contributes. He discusses the condition under the following headings: (i) Involvement of the whole bone with secondary invasion of the joint, as in the vertebral bodies and the small bones of the hand or foot. (ii) Involvement of part of

the bone, either the diaphysis without joint invasion, or an epiphysis with or without joint invasion. (iii) Joint lesions, which he considers rarely begin as a primary disease of the capsule, but most frequently as an extension from the neighbouring bone lesion. This extension is rapid in the case of the small bones of the wrist or foot, but it may be very slow in the larger bones and joints. Function is not disturbed for a long time, while the lesion is entirely confined to bone unless the supporting strength of the bone is diminished. In such cases pain is a difficult symptom to evaluate. The criterion for the choice of treatment is that it shall be reasonably certain of securing healing of the tuberculous lesion and terminating the illness as soon as possible; that it shall preserve the best possible function and that its cost shall not be prohibitive. General treatment to increase the resistance of the body to tuberculosis is fundamental, and local treatment consists essentially in rest and freedom from weight-bearing. Conservative treatment has been expressed in Putti's work as "complete ankylosis is the most desirable if not the ideal result of the treatment of a tuberculous joint lesion". The author thinks that the requirements for treatment may be better satisfied with radical measures in many cases which he classifies under: (i) those which combat the tuberculosis—eradication and resection, (ii) those which only improve function—arthrodesis and osteotomy. When all diagnostic aids verify the existence of a circumscribed tuberculous focus in the capsule or in the region of a joint, but not involving it, early eradication of the disease should certainly be attempted, even though rupture into the joint threatens and at this stage may stop the tuberculosis and preserve function. Resection, on the other hand, if performed later in this disease, is a mutilating operation and deliberately abolishes joint function. It is justified only in adults. Arthrodesis represents a compromise with the tuberculous infection and is fundamentally unsatisfactory. In appropriate cases osteotomy is a valuable and satisfactory operation to correct malposition.

Rupture of the Intervertebral Disk into the Spinal Canal.

W. J. MIXTER AND J. B. AYER (*The New England Journal of Medicine*, August 29, 1935) discuss thirty-four cases of rupture of the intervertebral disk into the spinal canal. Twenty-three of these were in the lumbo-sacral region, and they are in accord with other observers in believing that the enchondromata found in the spinal canal are identical with nodules which are described as herniations of the intervertebral disk. The condition has been described by Schmorl as prolapse of the *nucleus pulposus*. The diagnosis depends on the presence of neurological signs and has to be made from low back strain of one sort or another. Trauma was an inconspicuous factor in the production of the condition, and the nature of the occupation of the patients appeared to have no definite influence. Pain was the first symptom, and with a few exceptions remained the most important symptom throughout the course of illness. It was primarily in the lower part of the back, with sciatic radiation mainly, and was intensified by coughing, sneezing and bending. The symptoms and signs remained unilateral in more than half of the series; eight were on the left and seven on the right side at the time of operation. Less often symptoms were bilateral from the onset or became bilateral during the course of the illness. No regular course of illness was indicated. In some instances the symptoms progressed during two or three months with almost no interruption, with involvement of one lower extremity, then the other, and finally loss of sphincter control. More frequently, however, symptoms remained unilateral and intermittent over a period of many months or years, the patient enjoying relatively good health between attacks. The various cerebro-spinal fluid examinations for cell count, colloidal gold and Wassermann tests were performed as a routine; but their only diagnostic value was the exclusion of syphilis and inflammatory disease. The estimation of the protein content and of manometric pressure, however, proved of definite value. In only three cases was the fluid from below the lesion xanthochromic. Whether obtained from above or below the lesion, the protein content of the fluid was always increased. The authors' experience with radiographic examination following the injection of lipiodol indicated this procedure as of prime importance in diagnosis and the localization of rupture of the intervertebral disk; they were frequently able to obtain results which were almost pathognomonic of herniation of the disk. For this purpose they use five cubic centimetres of lipiodol in order nearly to fill the lumbo-sacral canal; the typical picture is that of a small mass always anterior to the dura and causing a filling defect of it. Of the twenty-one patients of their group in whom lipiodol was employed, visualization of the hernia was satisfactory in sixteen. Most of the symptoms and signs complained of by the patients so closely resembled back strain, lumbo-sacral or sacro-iliac strain as to be indistinguishable from these conditions in the absence of lipiodol examination. In the cervical region, with one exception, all the cases involved disks between the third and sixth vertebræ, and with one exception the rupture was found primarily in the mid-line. Sometimes the earliest, and always the most important, symptom to the patient was motor disability of the lower extremities; bilateral stiffness, often with twitching of the legs and a sense of weakness, were the usual symptoms. In the authors' series the lumbar spine appeared most vulnerable; nearly 50% of their herniæ implicated the disk between the fourth and fifth lumbar vertebræ. They consider visualization of the disk hernia to be not only an accessory finding, but one of paramount importance. If the technique is carried out with care that the mass is not broken up, the patient examined prone, and films taken at the appropriate angle to show the hernia, they consider that the test may well be said to be pathognomonic of the lesion.

Habitual Dislocation of the Shoulder.

M. S. HENDERSON (*The Journal of Bone and Joint Surgery*, October, 1935) describes the results of the teno-suspension operation for habitual dislocation of the shoulder. The tendon for use is derived from the *peroneus longus* tendon by means of a longitudinal slit, the remaining half of the tendon being resutured in position. He maintains that this tendon is preferable to *fascia lata*, on account of its strength and accessibility. The technique of introduction of the tendon has been altered by drilling a Kirschner wire through the acromion process and through the head of the humerus and threading over this wire a drill just large enough to make a hole which is fitted snugly by the *peroneus longus* tendon. This point is important, as he attributes failures to the hole's being too large and allowing the tendon to glide in the bone, the resulting traction causing its fracture. The arm should be held to the side for about three weeks, and abduction and rotation beyond one-third of normal range should be prevented for three months. Fourteen patients were operated on more than five years ago and twelve have been free of recurrence. Function following teno-suspension is excellent, practically full abduction and elevation being obtained.

Dislocation of the Patella.

F. FORTY (*The Lancet*, November 9, 1935) describes a new operation for treatment of recurrent dislocation of the patella. He discusses the place of the patella in the evolution of the erect posture. The operation described, which, he states, has been uniformly successful, depends on the displacement of the insertion of the patellar tendon to a more medial position on the tibia, so giving a new line of direction to the quadriceps muscle and bringing the patella permanently between the femoral condyles. At the same time a pedicle graft, shaped like an elongated V with the apex upwards, is taken from the medial side of the joint capsule and transplanted into the lateral side, the resulting narrowing of the medial side of the capsule thus serving to anchor the patella in its new position. The results are illustrated by case reports.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on November 25, 1935, in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, DR. A. M. DAVIDSON, the President, in the chair.

Injuries of the Knee Joint.

DR. J. S. MACMAHON read a paper entitled: "Traumatic Lesions of the Knee Joint" (see page 221).

DR. MCC. CALLOW read a paper entitled: "Internal Derangements of the Knee Joint" (see page 228).

DR. D. J. GLISSAN said that the instructive and thoughtful papers had covered an interesting field. He had been interested to hear Dr. MacMahon's account of the anatomical basis of the condition caused by injury. The interpretation of signs must be based on the anatomical factors. They had to remember that Dr. MacMahon's cases were those which occurred in public hospital practice. He would not like his general practitioner colleagues to be terrified by the injuries described. General practitioners had to deal with minor knee joint injuries. The diagnosis was made in accordance with the principles that had been enunciated, and the treatment was perhaps not quite so rigorous as one might be led to expect. Neither Dr. MacMahon nor Dr. Callow had discussed direct injury to the knee joint. In Dr. Glissan's opinion adhesions were commoner after direct than after indirect injuries. Dr. Glissan quite disagreed with one remark of Dr. Callow, namely, that, provided one could exclude certain things, recurrent synovitis was due to a torn meniscus. Several other common conditions caused these symptoms. Adhesions in a joint would cause pain, disability and recurrent effusion. After injury, wasting of the quadriceps would cause recurrent effusion. Returning to Dr. MacMahon's remarks, Dr. Glissan pointed out that when he spoke of rest he thought in terms of rest of the damaged ligaments and how far resting the ligament meant resting the joint. He did not agree that the length of rest required depended on the degree of damage to the joint. The ligament had to be protected until it was healed. Sometimes the joint needed rest to secure this protection, sometimes not.

Dr. Glissan himself had dislocated his elbow. He disagreed with the current views as to the necessity for rest in such cases, and within a few hours of reduction he began to practise active movement. In three weeks he was using his elbow for all ordinary purposes and made a complete and rapid recovery.

When the practitioner was faced with an injury to a meniscus he had to decide whether it was torn or not and, if torn, whether portion was displaced. If it was torn, was it likely to become displaced and, if displaced, was reposition likely to provide satisfactory results? Dr. Glissan wished to utter a warning against the use of knee cages, which should have no place in knee joint surgery, except in those conditions in which there was gross instability of the knee and in which operation was refused or was contraindicated. It was a serious mistake to allow a young person to wear a knee cage. He had formed these views as the result of observation upon returned soldiers, in whom the constant wearing of cages had caused gross local muscle atrophy leading to increased instability.

DR. LENNOX TEECE said that he had been waiting for a tilt from the general surgeons, but it had not come. Dr. MacMahon had shown cases in which there was damage to the cruciate or lateral ligaments causing persistent disability after the associated fracture had united. When complete dislocation of the knee joint had occurred and prolonged rest was given, it was the rule for patients to regain complete stability of the knee joint. People with lesser damage to the ligaments were not given so much rest and had worse results.

In regard to joint fracture, there was a difference in prognosis between femoral and tibial fractures of the knee joint. Patients with fracture of the lower end of the femur did badly, while those with fracture of the upper end of the tibia did well.

Dr. Teece recognized how difficult of diagnosis were injuries to the meniscus in the early stages. Those patients who were not seen early were worse off than those who were seen in the early stages. Of these patients, 50 did not have a typical classical history of locking and unlocking of the joint. If the medical attendant looked for locking only in making the diagnosis, he missed the diagnosis in 50% of cases.

Dr. Teece had been struck by how often the diagnosis was dependent on the history; the history with which everyone was familiar was due to a bucket handle tear. The most valuable sign in this condition, in the absence of locking, was obtainable by manipulation of the knee. While the patient bore his weight on the knee, the knee was circumducted clockwise and anticlockwise. It was then possible to feel something slipping, a crack or a jump.

Positive diagnosis should be made before and not during operation. The only way in which to discover whether the meniscus was normal was to take it out and have a look at it. On opening the joint it was possible to say only that there was no lesion in the anterior half. A type of case that did badly was one in which there was persistent locking of the joint extending over a long period, for example, from three to four months. Some of these patients, after the meniscus was removed, suffered from arthritis and had painful joints.

In conclusion Dr. Teece mentioned spontaneous tears of the medial meniscus, which could and did occur. In 500 to 600 cases he had seen about twenty with typical tears in which there was no history of injury; in some instances both joints were involved. One man worked on his knees for a roofing contractor. One knee started to lock and the other knee followed. At operation typical bucket handle tears were discovered on both menisci.

DR. A. R. HAMILTON recommended Dr. MacMahon to try the effect on tears of the anterior cruciate ligament of putting the limb in slight flexion, as Sir Robert Jones had done; he would find that he got even better results. He said that minor injuries to the meniscus were of three kinds. In the first there was nipping of the anterior end without tearing; in this type œdema occurred and considerable disability resulted. In the second there was a hypermobile cartilage (which might not produce signs, but was nevertheless torn from its attachments) with definite symptoms, resulting in an unstable joint. In the third there were small tears of the free edge of the posterior part of the cartilage. Effusion and atrophy of the quadriceps might be absent, and yet this was a real condition. A constant sign was tenderness at the back of the knee when the joint was flexed.

Dr. Hamilton spoke of the condition of complete cartilaginous disk instead of the usual crescentic disk. He had seen three cases of this condition which produced symptoms after minor injury. It could be detected by a creaking in the joint like the creaking of new leather.

In operations on the knee joint Dr. Hamilton advocated more extensive use of the no-touch technique in operations. It was easy to acquire and gave a greater sense of security. He also spoke of the possibility of removing the whole cartilage from the anterior incision, and said that it could be done.

Dr. Glissan had mentioned adhesions from direct trauma, but he had not mentioned direct breaking down of adhesions by manipulation. Dr. Hamilton congratulated Dr. Glissan on not developing *myositis ossificans* after too early use of his elbow.

DR. S. H. SCOUGALL congratulated the speakers and expressed appreciation of the remarkable series of cases discussed by Dr. MacMahon. These cases provided an argument for the unity system of treatment of fractures. In

England a report had been issued by the British Medical Association in which the unity system of controlling fractures was advocated. The results of this report were an argument for medical practitioners to put their house in order in this direction.

Concerning gross injury to the knee joint, demonstrated by Dr. MacMahon, Dr. Scougall was impressed by his relying for immobilization on unpadded plaster almost two-thirds of the way up the thigh. Though the lower part of the splint and the part surrounding the knee were fixed, there was a lack of fixation at the upper end. It was his practice to supplement a thin unpadded plaster with the use of the Thomas splint. He used the splint early and employed a walking calliper later on. The results with these two measures had two differences from those of Dr. MacMahon. There was less instability in the knee but lowered range of movement. Dr. Scougall would like to know what difference he might expect in the late after results in the two types of treatment.

Dr. Scougall said, concerning end results, that traumatic arthritis was more likely to develop in knees showing a moderate amount of instability. This was a serious end result and perhaps one should be content with less movement and greater stability.

He was glad that Dr. Callow had avoided academic discussion of the subject. He had been struck with a symposium in *The Journal of Bone and Joint Surgery* two years ago, in which twenty-one orthopædic surgeons had been given a *questionnaire*; there had been a great diversity of opinion on the most simple aspects of the subject. Dr. Scougall was glad that Dr. Callow had stressed the diagnostic features of unlocking of the cartilage, which were stressed in very few text-books. He was convinced that a loose or mobile cartilage causing derangement of the knee joint was a definite entity. He had also seen three cases in recent years in which there was clinically a gross lesion of the anterior horn; definite audible snapping at the anterior cornu was accompanied by no other sign or symptom. He had had experience of similar lesions without disability and thought that such patients should be left alone in suitable occupations. Another type of internal derangement of the joint which called for empirical treatment of the joint was that which gave no sign except minor painful limitation in one direction with a sense of "giving". This condition generally responded to manipulation.

Dr. MacMahon, in reply, referred first to Dr. Glissan's remarks. He stated that he had discussed cases in which major injuries had occurred, as in public hospital practice he had come in contact with the more serious types of injury. With regard to minor injuries of the knee joint, he had stressed the necessity for care in diagnosis. Dr. Glissan had stated that he did not consider prolonged rest of joints after injury should be a generalization, as he himself had received an injury to his elbow joint which he did not consider should have rest, but active movement, and he had obtained a good result. Dr. MacMahon pointed out that he was discussing only injuries to the knee joint, for which stability was essential. The treatment should be directed towards obtaining a stable joint. The elbow joint offered a different mechanical problem; in it the primary function was mobility, and treatment should be directed towards obtaining a movable joint. Each joint should be considered from the point of view of the mechanical problems it presented. The same principles applied in dislocations of the shoulder joint and the hip joint. Here mobility was essential. He instanced a case of dislocation of the hip joint which, after reduction, had been immobilized in a plaster of Paris spica for some time. The patient had very little movement in the hip joint, as a result of misdirected treatment, and had been discharged from the out-patients' department with a diagnosis of ankylosis of the hip joint. Twelve months later he had appeared in a police court, in an action for damages, with a full range of movement in the hip joint. Had this patient been allowed to move his hip joint after reduction of the dislocation he would not have developed any stiffness. A patient, after reduction of a dislocation of a hip joint, might walk about quite freely three or four days after reduction.

The good results noticed by Dr. Teece after dislocation of the knee joint were due to the fact that the severity of the injury necessitated enforcement of prolonged rest, which allowed sufficient time for torn ligaments to unite. The relaxed joints of less severe injuries were usually the result of insufficient immobilization and were due to early mobility, which was possible in these cases.

Dr. Hamilton had mentioned the treatment of rupture of cruciate ligaments by keeping the joint in slight flexion. Dr. MacMahon could not altogether agree with this, but stressed the importance of avoiding hyperextension. In the majority of cases the result would be as good in slight flexion as in extension; but in an occasional case treated in flexion contraction of a ligament would occur, with pain on attempting extension, which might persist for some time. In the treatment of rupture of the internal lateral ligament it did not matter whether the joint was treated in extension or slight flexion, as the tension of the ligament in both these positions was unaltered; but hyperextension should be avoided. As a generalization, all ligamentous knee joint injuries should be treated comfortably in extension. This gave the best results.

Referring to Dr. Scougall's remarks about the unity system in fractures, Dr. MacMahon said that, unfortunately, well organized fracture clinics with unity of control had not been adopted in Sydney. He hoped, however, that such would soon be the case. The Royal Prince Alfred Hospital would shortly be establishing a fracture clinic. It was generally recognized that this system was the only one that led to efficiency in treatment. When many patients were treated together, they watched, imitated and taught each other. In the clinic of Lorenz Böhler in Vienna there were many people with the same type of fracture treated together. There might be eight or ten people with fracture of the spine, all in different stages, and the newcomer was inspired by the example of the convalescent patient, who often taught him his exercises and encouraged him to cooperate and persist in his treatment. In regard to the length of plaster required for immobilization of the knee joint, Dr. MacMahon thought that sufficient immobilization was obtained in a plaster cast consisting of a long posterior slab extending from the upper third of the thigh to just above the ankle joint, which was bandaged on the limb by a gauze bandage and one plaster bandage. A reinforcing slab should be placed on the inner side to prevent lateral bending in the case of rupture of the internal lateral ligament. The bandage should merely be rolled on the leg. The stiffness and adhesions complained of by many surgeons in the joints of patients immobilized in plaster were the result of inactivity and did not result from the plaster itself. This did not apply to people in plaster who walked about and actively used the affected limb. Active contraction of muscle aided the venous return and promoted absorption of exudates. If the muscles were contracting, extravasated blood was more readily absorbed and did not undergo organization and adhesions were less likely to result.

Dr. Callow, in reply, said that he was sorry more brickbats had not been thrown. He had made some very dogmatic statements. In regard to Dr. Glissan's remarks concerning adhesions, Dr. Callow said that he himself had probably mistaken the diagnosis. He spoke of the rarity of torn quadriceps and said that he had seen only one case; in this instance but little movement resulted.

Dr. Teece had mentioned the long disability remaining after locking of the knee. Dr. Callow spoke of a case in which it had been locked for six months; recovery took eight months and there was no disability.

Dr. Callow agreed with the points that Dr. Hamilton had made. In regard to removal of the whole cartilage, Dr. Callow had only twice opened up the joint posteriorly.

A MEETING of the Queensland Branch of the British Medical Association was held at the Mater Misericordiæ Children's Hospital, Brisbane, on October 4, 1935. The

meeting took the form of a series of demonstrations by members of the honorary staff. Part of this report appeared in the issue of February 8, 1936.

Neutropenia.

DR. P. A. EARNSHAW showed a girl, eleven years of age, who was admitted to hospital on July 28, 1935. She gave a history that for two years prior to admission she appeared to be a well nourished child, but was very pale. Nothing abnormal was found in the examination of the heart, lungs, abdomen, urinary or central nervous systems. She had, however, several very bad carious teeth. Her blood count on admission revealed 2,950,000 red cells and 2,600 white cells per cubic millimetre; neutrophile cells were 20% and lymphocytes (all mature) 80%. The hæmoglobin value was 48% and the colour index 0·8. Megaloblasts were present; there were marked anisocytosis, poikilocytosis and polychromasia; the platelets were normal and no punctate basophilia was seen. The coagulation time and the bleeding time were normal. The child was then given pentose nucleotide, ten cubic centimetres, daily for eighteen days. While having the injections there was a daily rise of temperature to a height varying between 38·3° and 39·4° C. (101° and 103° F.). Under this treatment the total count of red and white cells remained stationary, but the proportion of neutrophile cells rose from 20% to 40%. It was then decided to give a blood transfusion and Dr. Windsor administered 500 cubic centimetres of the father's blood. The child immediately assumed the appearance of a healthy child. The white cells had since varied between 5,000 and 7,300 per cubic millimetre, the neutrophile cells being in the proportion of 40% to 65%. The red cell count had remained at about 4,600,000 per cubic millimetre. In the last two to three weeks the neutrophile cells had dropped from 55% to 40%, so a course of pentose neucleotide was recommenced.

Lymphatic Leuchæmia.

Dr. Earnshaw's next patient was a boy, aged two years and nine months, who was admitted to hospital on August 6, 1935. His mother stated that in June, 1935, he had developed diphtheria and was admitted to the Children's Hospital, where he remained for a month. The mother stated that when he returned home he could not walk. A week later both feet became swollen and remained swollen for a week. He was then quite well till two days before admission to hospital, when he cried on account of pain in the feet and legs. His legs again became swollen and his face was also swollen. When admitted to hospital he was œdematous all over. He was pale and there was much nasal discharge. His feet were exceedingly swollen and were tender to touch and to movement. Nothing abnormal was found in the lungs or abdomen. The heart beat was rapid, the rate varying between 110 and 130 per minute. There were no murmurs and no increase in the area of cardiac dulness. The upper air passages were swabbed, but no diphtheria organisms were found. At no time did the chemical examination of the urine reveal any abnormality. A few epithelial casts were discovered microscopically. The blood urea was 51 milligrammes per 100 cubic centimetres. The urea concentration test showed 1·812% before urea was given and 2·425% two hours later. The Wassermann test gave no reaction. Six days after the patient's admission to hospital a blood count revealed 3,540,000 red cells and 8,900 white cells per cubic millimetre. The hæmoglobin value was 70% and the colour index 1·1. Neutrophile cells comprised 23%, lymphocytes 76%, eosinophile cells 1% of the white cells. Anisocytosis, poikilocytosis and polychromasia were present. The platelets were normal; there were a few megaloblasts. The coagulation and bleeding times were normal.

On August 22, 1935, the spleen could be felt 1·25 centimetres (half an inch) below the costal margin, and it was firm in consistency. The child then developed chickenpox. On September 2 he complained of tenderness, and a swelling appeared in the upper end of the left forearm, after an irregular temperature for ten days. The elbow joint was not involved. Osteomyelitis was considered and another blood count was done, which revealed that the red cells had fallen to 2,950,000 and the white cells had risen to 13,000 per cubic millimetre. The colour index was 1·0; neutrophile cells were 11% of the white cells, while lymphocytes had risen to 88%. By this time the child had assumed the pale waxy appearance of leuchæmia. The spleen was palpable and the superficial lymph glands were palpable and shotty. A few days later another blood count revealed 16,300 white cells per cubic millimetre, of which 89% were lymphocytes. There were a number of miniature cells resembling myeloblasts and many nucleated red cells. Since that time the boy had steadily become worse. The white cells had dropped to 9,700 per cubic millimetre, of which 89% were lymphocytes, and the red cells had dropped to 2,090,000 per cubic millimetre. The spleen varied in size, sometimes being 5·0 centimetres (two inches) below the costal margin and sometimes not palpable.

Myelogenous Leuchæmia.

Dr. Earnshaw also showed a boy, aged six years, who was admitted to hospital on July 14, 1935, with the history that for six months he had been losing weight and becoming pale. A fortnight previous to that date the abdomen had become swollen and hard. He took little food, was listless and tired, and complained of aches in the arms and legs. He was admitted to the Toowoomba General Hospital and was then referred to the Mater Misericordiæ Children's Hospital.

On admission the child was very pale. The abdomen was greatly enlarged, the enlargement being due to a huge spleen, which extended to 2·5 centimetres (one inch) to the right of the umbilicus and to a level of 5·0 centimetres (two inches) below the umbilicus. It was firm and not tender. The liver extended to 5·0 centimetres (two inches) below the costal margin; there were no palpable glands and no petechiæ. The tonsils were considerably enlarged and of unhealthy appearance. Since being in hospital the child had been subject to a slight irregular temperature. On admission a blood count revealed 3,470,000 red cells and 31,300 white cells per cubic millimetre; the hæmoglobin value was 61% and the colour index 0·9. Numerous neutrophile and eosinophile myelocytes were seen. There were marked anisocytosis, poikilocytosis and polychromasia. There was slight punctate basophilia; there were numerous nucleated red cells, normoblasts and megaloblasts. The platelets were normal; the coagulation time was normal and the bleeding time was slightly prolonged. The child was referred to the cancer clinic for deep X ray therapy and nine applications of this were given, the last application being on August 30, 1935. The child had also been given iron and ammonium citrate in doses of 0·6 gramme (ten grains) three times daily. A blood count done on September 27 revealed that the red cells had increased to 3,570,000 and the white cells had diminished to 8,600 per cubic millimetre. The hæmoglobin value was 63% and the colour index 0·9. Many myelocytes and nucleated red cells were present in the film. There were marked anisocytosis, poikilocytosis and polychromasia. The child's tonsils, which were very unhealthy, were removed on September 23, 1935. The boy's condition had improved greatly since his admission to hospital. Dr. Earnshaw said that myelogenous leuchæmia in childhood was a rare condition, there being about forty recorded cases in the literature.

Arterioslerotic Kidney and Nephritis.

Dr. Earnshaw's last patient was a child who had been sent in with a diagnosis of heart disease. For twelve months he had complained of headache, which was mainly frontal, of epistaxis, and of swelling round the eyes. His sight was normal. The appetite was poor. For the same period he had been cyanosed and had been getting tired and short of breath. On examination the child was found to be a mouth breather; he was well nourished. The cardiac apex beat was found to be 8·75 centimetres (three and a half inches) from the mid-line, in the sixth interspace, and there was a systolic murmur and the second sound was reduplicated. The heart was enlarged 2·5

centimetres (one inch) to the right of the sternum. The liver could be felt one inch below the costal margin. The systolic blood pressure varied from 100 to 130 millimetres of mercury. A urea concentration test showed the figures 1·3% before the urea was given, 1·6% two hours after it was given, and 1·68% two and a half hours afterwards. The blood urea test showed 140 milligrammes of urea in 100 cubic centimetres.

A blood count revealed 3,680,000 red cells and 17,600 white cells per cubic millimetre; the hæmoglobin value was 70% and the colour index 0·9. Neutrophile cells numbered 24%, lymphocytes 18% and eosinophile cells 58% of the white cells. Anisocytosis, poikilocytosis and polychromasia were present; the platelets were normal. The fragility test gave a normal result and the coagulation time was normal. The Wassermann test gave no reaction. The spleen was palpable. An X ray examination of the chest revealed an increase in the peribronchial tissues and enlargement of the hilum.

The condition was evidently that of an arteriosclerotic kidney associated with nephritis, the heart being enlarged almost to the size of a bullock's heart.

NOMINATIONS AND ELECTIONS.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Hedberg, Eric Alfred, M.B., B.S., 1926 (Univ. Sydney), 19, Rosebank Avenue, Epping.

Medical Societies.

PUBLIC MEDICAL OFFICERS' ASSOCIATION OF NEW SOUTH WALES.

THE tenth annual general meeting of the Public Medical Officers' Association of New South Wales was held at the British Medical Association House, 135, Macquarie Street, Sydney, on January 30, 1936. Dr. T. L. O'Reilly, the President, occupied the chair, and 25 members were present. The Secretary submitted the Committee's report for the year 1935 as follows:

Annual Report.

1. The year 1935 has not been a successful one for this Association. The slow progress made in recent years towards the attainment of our objectives suggests that our methods are not suited to the political and economic conditions of the present day. Consideration of a change in methods necessitates a decision as to how far the Association should enter into semi-political activities, and it is desirable that members should give an indication of their wishes in this matter.

2. There are 87 active members of the Association, and, in addition, seven retired medical officers are retained as honorary members on the Association's roll.

3. The Committee met 12 times during the year, the numbers present on the several occasions being 8, 9, 8, 10, 9, 8, 8, 8, 7, 5, 9, 9. The attendances of the individual members of the committee were: Dr. T. L. O'Reilly (President), 12; Dr. S. Evan Jones, 9; Dr. H. H. Nowland, 9; Dr. H. V. Baret, 10; Dr. E. L. Morgan, 8; Dr. C. E. Percy, 10; Dr. Madeline Gors, 9; Dr. W. K. Flook, 10; Dr. M. R. Finlayson, 6; and Dr. H. H. Willis (Secretary), 12. Dr. Dorothy McClemens attended two meetings as substitute for Dr. Gors (on leave).

4. Relations with the British Medical Association remain unchanged. There are indications of a growing conviction in the profession that the present method of election does not produce a Branch Council qualified to speak for all the various sections into which modern conditions have divided the medical profession. It is hoped that in any change of constitution provision will be made for the election of one member by members of this Association. Our thanks are due to Dr. Kenneth Smith, who presented our viewpoint at meetings of the New South Wales Branch Council for several years prior to his transfer to Melbourne in March, 1935.

5. This Association has been invited during the year by the Teachers' Federation to join other service organizations in a political agitation against the continuance of salary cuts in the New South Wales Government services, but has refrained from doing so.

6. Our relations with the New South Wales Public Service Board are definitely unsatisfactory. All efforts to obtain an interview with the Board have failed, and our written representations have received very little consideration. Pending a change of policy or of personnel of the Board it would seem of little use to address that body further.

7. Some consideration has been given to the possibility of bringing the salaries of our junior members under review by the State Arbitration Court, but the decision of the Association not to register as a trade union has been found an obstacle.

8. As the biennial review of salaries of those members employed by the New South Wales Government fell due this year, the Committee placed its views on certain salaries before the Public Service Board, but was informed that the Board would not discuss the salaries of individuals with the Association. It would appear that the Board intends to revert to the bad old system of dealing with members separately. It is hoped that members will not allow their jealousies to be exploited, nor their duties and qualifications to be used in argument to the detriment of their colleagues.

9. Some attention has been paid during the year to the grievances of members in the Repatriation Service, notably the absence of any sort of superannuation or long service leave, and the poor opportunities for promotion in that department. On two occasions requests for a retiring gratuity were made to the Federal Government, but without success.

10. The great difficulty experienced in filling vacant positions during the year indicates that the present remuneration and conditions in all the services are not sufficiently attractive to likely applicants.

11. As a result of group activities through intra-departmental channels the Repatriation Commission has at long last accepted the Federal Arbitrator's award for the health service as the basis for determining medical salaries in the Commission's service. This has resulted in slight increases for our members in the Repatriation Office and some very considerable benefits for those employed in hospitals under the Commission's control.

12. The Committee has decided to offer no objection to the Repatriation group registering along with similar groups in other States as an industrial organization under the Commonwealth *Arbitration Act* if members of that group think such action necessary.

13. No social function was organized by the Association this year because of the many functions arranged in connexion with the annual meeting of the British Medical Association in Melbourne in September, 1935.

14. During the year the New South Wales Public Service Board, by a harsh interpretation of Regulation 152, tried to impose a monastic mode of life upon resident medical officers in institutions under the Board's supervision. Further action will be necessary to secure reasonable leave and working conditions for those employed in those institutions.

15. On March 1 last, at the invitation of the State Premier, two members were sent to a deputation which asked for a rescission of the salary cuts imposed some years ago by the financial emergency legislation.

16. The Committee has again advised members that membership of the New South Wales Medical Defence

Union is the only available means of protecting themselves against actions at law arising out of their duties as public medical officers.

17. The Committee has sought the assistance of the New South Wales Branch of the British Medical Association in opposing any proposal to import foreign graduates to fill positions vacant because of unsatisfactory remuneration and conditions.

18. The New South Wales Minister for Health has been asked to insert in the Bill providing for a board of management for the Prince Henry (Coast) Hospital, a clause conserving the public service rights of the existing medical staff of that institution.

19. In recent years several of our members have retired from the services on account of age who are still able and willing to continue to work. It is hoped that by the goodwill and cooperation of our members something may be done to place these gentlemen in congenial employment.

20. The Financial Statement is appended.

After discussion the report was adopted.

Financial Statement.

The Honorary Treasurer, Dr. C. E. Percy, submitted his financial statement, which was approved. It showed receipts of £29 10s. 1d. and expenditure of £7 7s. 2d. The credit balance on December 31, 1935, was £439 2s. 9d.

Election of Office-Bearers.

The election of officers for the ensuing year resulted as follows:

President: Dr. H. G. Wallace.

Honorary Auditor: Dr. S. McGeorge.

Honorary Secretary: Dr. H. H. Willis.

Honorary Treasurer: Dr. C. E. Percy.

Committee: Dr. C. E. Percy, Dr. E. L. Morgan and Dr. H. V. Baret (State Health Department), Dr. H. H. Nowland and D. J. M. Rainbow (Mental Hospitals Department), Dr. Madeline Gors and Dr. W. K. Flook (Education Department), Dr. G. L. S. Saunders (Works and Railways), and Dr. H. H. Willis (Repatriation Department).

Votes of Thanks.

The meeting ended with a vote of thanks to Dr. O'Reilly for his services during the year.

Medical Practice.

THE ADELAIDE RADIOTHERAPY CLINIC.

THE following is the third circular issued from the Radiotherapy Clinic at the Adelaide Hospital.

A meeting of the Adelaide Hospital Radiotherapy Clinic was held in July, 1935. The treatment of cancer of the skin of the hand was discussed.

CANCER OF THE SKIN OF THE HAND.

Literature.

It is somewhat surprising to find in the review of the literature very few and scanty references to treatment of epithelioma of the hand, as distinct from the same condition in other areas of skin. The literature concerning cancer of the skin generally is, of course, most extensive.

Several authorities in various countries emphasize the value of X rays in cancer of the skin, Molesworth, of Sydney, being probably the keenest protagonist in Australia of this form of therapy. Failure with X ray treatment is due, in his opinion, to the fact that some radiologists fear to produce with X rays a type of reaction similar to that which usually follows radium therapy; and he is sure that, given equal severity of reaction, X rays are in every way as valuable as radium for treatment of newgrowths of the skin.

Howard Kelly, at the Clinical Congress of the American College of Surgeons, held at Philadelphia in October, 1930, claimed that epitheliomata of the dorsum of the hand and wrist, even when the growth extends into the tendons, are admirably handled by electro-surgery, which is second in value only to radium.

Tyler, in the *Nebraska State Medical Journal*, November, 1931, gave his opinion that the dorsum of the hand does not bear X ray or radium therapy very well; this is due, he says, to the paucity of subcutaneous tissue. If sufficient radiation is employed to destroy the growth, circulation is considerably diminished, and a little scratch or other trauma after the radiation scars heal will frequently cause the tissues to break down and an indolent ulcer to form. Repair of this is slow.

Daland, reviewing statistics of 265 patients with cancer of the skin entering the Huntington Hospital in the years 1917 and 1918, concludes that cancer on the dorsum of the hand should be excised, as heavy radiation of synovial membranes causes complete disability of the hand for several weeks.

Discussing the question of glandular excision in carcinoma of the hand in X ray workers, Sampson Handley states that simple dissection of the axilla will not meet the case, as nearly always the first gland to be invaded is the supratrochlear gland. He advocates an operation in which is removed the supratrochlear gland, with a sheath of fat surrounding it, in continuity with a band of deep fascia, an inch wide, extending to the axilla. The axilla is then cleared. He advises this operation as soon as glandular enlargement can be detected in either gland area, and even in cases in which the glands are normal to palpation.

The scantiness of references in the literature to neoplasm of this particular region is the more surprising in view of the experience in a small clinic like that of Adelaide. Among patients treated during the past six years in the Adelaide Hospital Radiotherapy Clinic, there have been 78 examples of epithelioma of the dorsum of the hand, wrist or forearm, while in the same area 93 cases of hyperkeratosis, 17 rodent ulcers, and five other lesions, including melanoma and Paget's disease, have been treated. It has been found that glandular invasion, though still relatively rare, is much more common than with epitheliomata of other areas of skin (exclusive of tumours of the penis, vulva and lips); a possible reason is that the hand is subject to much more frequent injury and consequent infection.

Treatment.

Early in the history of the clinic members had come to recognize certain peculiar difficulties in radiation treatment for growths in this area. Lesions which, when first seen, have been adherent to tendon or bone, have not responded satisfactorily to radium treatment, and this is particularly true when the affected area is greater than about 3·0 centimetres in diameter. Because of this it is now the custom to treat by surgical means any malignant ulcers of a size greater than 3·0 centimetres in diameter if they are fixed to deeper tissues. On the whole, the smaller lesions and those which are not fixed respond very readily to radiotherapy, although occasionally a resistant type of tumour is met with.

One of the main difficulties encountered in treatment of tumours in these areas is the liability to radio-necrosis. The exact definition of necrosis is perhaps a personal matter, but as most post-radiation reactions have subsided within about two months, for the purpose of this review any simple ulceration that has persisted after treatment for longer than three months has been classed as necrosis. In the 193 lesions treated, there were 15 examples of necrosis. In the earlier years of the clinic many lesions were treated by the implantation of needles, some of the

latter being of high concentration and some relatively lightly filtered, for example, with monel metal, 0·5 millimetre wall thickness. The incidence of necrosis has been lessened by insistence on the use of a radium pack in preference to interstitial needling. With the use of radium moulds there have been only two cases of necrosis in the 66 times that this method has been adopted, while with interstitial needling there were five examples of necrosis in 16 treatments attempted. When needles of low intensity and satisfactory filtration have been used the examples of necrosis have been much fewer. It is important to realize, however, that interstitial treatments of lesions of the face with similar high intensity and lightly filtered needles have been very rarely followed by chronic simple ulceration, so that the liability of the hand to suffer this damage is obviously much greater. The situation of the lesion also influences results. It has been found that treatment of lesions on the wrist is most frequently followed by necrosis, five instances of necrosis having occurred out of the 17 treatments of this site, whereas only nine cases of necrosis were found in 119 treatments on the dorsum of the hand. Experience in the clinic of the use of X rays in this site is limited, but there has been one instance of unexpected necrosis among the few cases treated by this method.

Summary.

To sum up, then, cancer of the skin of the hand, wrist and forearm, other than melanoma, is quite well treated by means of radium, except when the tumour is large and fixed to tendon or bone. Special care must be taken, however, in the application of radium, and it is desirable to apply the radium, whenever practicable, in the form of a surface treatment by means of a radium mould.

It has been the Adelaide Clinic's experience that the application of a radium mould over the scar of a recent excision is more likely to be followed by necrosis than the application of a similar mould to a tumour which has not been treated surgically. Members of the clinic cannot convince themselves that biopsy has had any bad influence on the results, and a small biopsy incision certainly does not increase the liability to radium necrosis.

Glandular deposits have been found to be relatively rare, and it is the clinic's opinion at present that if the lymph glands are not palpable when radium therapy is carried out, then excision of the glandular areas is unnecessary, provided a careful watch can be kept on the patient, who should be examined at two-monthly intervals for the first year. Enlarged lymph glands in the areas draining an ulcerated tumour are often only inflammatory, and it has been the custom to observe these for some weeks after the application of a radium mould. If they subside with healing of the primary tumour, the gland areas are left untreated, but if they remain enlarged, or if enlargement is felt at some time after treatment of the primary growth, then dissection of the supratrochlear and axillary areas is carried out and is followed by a course of high voltage X ray therapy if deposits should be found in any of the glands.

Post-Graduate Work.

THE SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE, UNIVERSITY OF SYDNEY.

THE attention of medical graduates is drawn to the courses now available at the School of Public Health and Tropical Medicine, the University of Sydney.

The Diploma in Tropical Medicine provides an excellent course for any graduate interested in laboratory work, especially bacteriology, pathology and parasitology. It is particularly suited to the requirements of graduates wishing to practise in Queensland and the adjacent islands. It includes special courses, which may be taken independently of the diploma.

The school has an excellent reference library, and suitable clinical material is available.

The course for the Diploma in Tropical Medicine, which occupies fifteen weeks, commences on February 17, 1936.

The course for the Diploma in Public Health is now being held; it is so arranged that by giving every weekday afternoon, Monday to Friday, throughout the year, the full requirements of the General Medical Council can be met.

The staff of the school is reinforced by a number of visiting lecturers, and every effort is made to provide instruction by recognized authorities on their particular subjects.

Full detailed information can be obtained from the Director.

Correspondence.

MANGOES AND BOILS.

SIR: Last year an incident that cropped up in the course of practice indicating a causal relationship between the eating of mangoes and the occurrence of boils was reported by me. A letter from Dr. Finckh appeared shortly afterwards in the journal. He was unable to find sufficient proof in the facts submitted. He related how on a South Sea island many years ago he had been told that if he ate porridge he would be "having boils all over", also that if he drank water that eggs had been boiled in he would get "warts on his nose", and, lastly, if he drank milk from green coconuts too freely he would "get the clap as sure as eggs were eggs". No reply was made to his letter at the time, as the relevancy of the old wife tales and of the autobiographical reminiscences of his appendages was not apparent.

Since then, however, further evidence has been collected, mostly from Queensland, which leaves little doubt that in certain individuals boils are apt to appear after eating mangoes. One instance is that of three persons being affected in a family of five, the mangoes having been purchased by the case from a soldier's settlement.

Perhaps also the following interesting story may be cited, though it gives but slender support, if any:

> Examining a man about thirty years of age (an electrician working in Mosman), a number of small pitted scars were found on the trunk and limbs. Questioned, he replied: "Oh! I had those when a baby in arms; I was born in Tahiti; they were boils, 37 altogether." He supplied further details obtained from his mother confirming this, and also stating that he had been fed on the breast, that his mother was "very fond of mangoes", and that they had a large mango tree growing on each side of the house.

However, it is only through sheer weight of evidence that any medical theory can be accepted. It seemed, therefore, that more valuable help would be obtained if the patient quoted in my first letter could be induced to accept for the third time a case of mangoes at Christmas time in order to find out if a third crop of boils would arise. It was explained to him that it was not only in the interests of science, but also as a gesture of good will for the festive season.

Unfortunately he was not at all helpful. In his refusal of the present there was an unnecessary emphasis of expression. Men born and bred in the country are so downright.

Yours, etc.,

F. S. TANGE.

Undated.

Obituary.

WILLIAM HENRY CRAGO.

We regret to announce the death of Dr. William Henry Crago, which occurred on February 6, 1936, at Roseville, New South Wales.

AUSTRALIAN ARMY MEDICAL CORPS.

The Committee of the Officers' Mess of the Australian Army Medical Corps, Second Military District, has arranged a farewell function in honour of Quartermaster and Honorary Lieutenant A. Christie, M.B.E., who is to be transferred to Melbourne. The function will be held at the Imperial Service Club, Sydney, on February 22, at 8.30 p.m. During the evening a presentation will be made in appreciation of this officer's service with the Australian Army Medical Corps, Second Military District, during the past ten years. Subscriptions, not exceeding 10s., may be forwarded to the Honorary Secretary, A.A.M.C. Officers' Mess, Victoria Barracks, Sydney. Those who intend to be present are asked to communicate with the Honorary Secretary without delay.

Diary for the Month.

FEB. 18.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 19.—Western Australian Branch, B.M.A.: Branch.
FEB. 22.—Tasmanian Branch, B.M.A.: Annual Meeting.
FEB. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
FEB. 26.—Victorian Branch, B.M.A.: Council.
FEB. 27.—South Australian Branch, B.M.A.: Branch.
FEB. 28.—Queensland Branch, B.M.A.: Council.
MAR. 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAR. 3.—Tasmanian Branch, B.M.A.: Council.
MAR. 4.—Victorian Branch, B.M.A.: Branch.
MAR. 4.—Western Australian Branch, B.M.A.: Council.
MAR. 5.—South Australian Branch, B.M.A.: Council.
MAR. 6.—Queensland Branch, B.M.A.: Branch.
MAR. 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAR. 10.—New South Wales Branch, B.M.A.: Ethics Committee.
MAR. 10.—Tasmanian Branch, B.M.A.: Branch.
MAR. 13.—Queensland Branch, B.M.A.: Council.
MAR. 16.—Federal Council, B.M.A.
MAR. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAR. 18.—Western Australian Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xvi-xviii.

INFECTIOUS DISEASES HOSPITAL, FAIRFIELD, VICTORIA: Junior Resident Medical Officer.

MABEEBA BABIES' HOSPITAL, WOODVILLE, SOUTH AUSTRALIA: Resident Medical Officer.

MOOROOPNA HOSPITAL, MOOROOPNA, VICTORIA: Junior Resident Medical Officer.

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Medical Superintendent.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON, NEW SOUTH WALES: Resident Medical Officer.

ROYAL PRINCE ALFRED HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.

THE BENEVOLENT SOCIETY OF NEW SOUTH WALES: Honorary Officers.

THE UNIVERSITY OF SYDNEY, NEW SOUTH WALES: Professorship of Pathology.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Richmond District Hospital, North Queensland. Members accepting LODGE appointment and those desiring to accept appointments to any COUNTRY Hospital, are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £1 for Australia and £1 5s. abroad *per annum* payable in advance.